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EDITORIAL NOTES.

The President and the New Industrial Life.

A NEW spirit and a new enthusiasm are abroad in the gas industry to-day. Their existence was not in such striking evidence as they are now that the first annual meeting of the British Commercial Gas Association has been held, in Manchester, under the presidency of Mr. Corbet Woodall. Under this one headship this year are united the three organized forces that have made possible what we see about us to-day; and with the experiences and impressions of last week's unique gathering fresh in memory, we cannot but feel that a good era has opened in the work of the industry, and that the result of the new order of things will be a manifold usefulness, contributing to strength and progress. Union *is* strength. No one could have been present at the meetings last week without realizing in its fullness the oneness of the industry, and the oneness or mutuality of its interests. The controllers of the operations of company and municipal gas enterprise, the executive officials of these enterprises—engineers, managers, and secretaries—the producers of gas plant and gas appliances, sat as one in conference over matters pertaining to the common ends of industrial service and progress. Here we have a real industrial organization, though not an organization with such large potentiality as we once pictured, and to which more than once we have given advocacy. But, at any rate, we are satisfied that this organization has produced in part the premeditated effects and working capacity. It may perhaps be permitted us to say that we take some little pride in having initiated an important part of the means that have accomplished the end in view, and accomplished it in a measure that gives no small gratification. There is the Institution on the one hand; and, on the other hand, there is the Society of British Gas Industries—a Society whose origin is due to an article in our columns, at the time of the Earl's Court Exhibition, suggesting the formation of such a body. Between the Institution and the Society comes the British Commercial Gas Association, providing common ground for industrial activity—a ground on which capital and all forms of gas commerce can operate in unison in the promotion of the industry's progress, which term is synonymous with greater service to the community.

The new spirit and the new enthusiasm that the meetings of the combined forces last week brought to light struck the President deeply; and he voiced his feelings on more than one occasion in his extempore speeches. "I cannot "tell you," he remarked at one point of the proceedings, "how impressed I am with these gatherings. The idea of "this united action on the part of the various interests "which go to make up the gas industry as a whole has "(shall I say?) 'caught-on.'" And again: "I am not "familiarized with it yet; I have never known any-"thing like it in the course of my professional career." Further, "the atmosphere of these meetings throughout has "been cordial, friendly, and intimate." "The whole thing "is a brilliant success." The words expressed the general view. In his address, the President had deliberately penned his anticipations as to the results of the new industrial movement; but we venture to think that the thought had never crossed his mind that the meetings at which this address would be delivered would dwarf his predictions in the manner of their realization. "The Association heralds "a new birth in the gas industry," he wrote. And "the "idea of mutual interest is of comparatively recent growth; "but it will continue to grow, and that luxuriantly." The prophecy has a good foundation; and the fact expressed in the first part of the statement illustrates the narrowness and the exclusiveness that once dominated the industry, but which have now, in accordance with the spirit of the times, been set on one side with a permanence that can never be re-established under the new order of things.

We have before us a natural development, the progress of which it is not in any man's power to stay; and it would be an ill-thing for the gas industry if the power existed. We are enjoined by the President to look ahead from our present standpoint. But if perchance we do look back, it is only to see that there is nothing in the modes of past times that suits the commercial needs of the industry to-day. But looking forward, we see the requirement of union in effecting the largest measure of progress and service. Vitality and the power of growth in the industry are there; they have to be guarded and nurtured. The Association supplies the means of accomplishing both, under the union that it has effected, by the spreading of knowledge in places that cannot be reached with authority other than through a recognized organization, and by attacks upon misconception and ignorance. The President, too, was insistent on members of the Association keeping in view a higher plane of service than is the conception of the mind that only looks upon commerce as the means to the money-making end. What the President intends to convey is this, that we should keep well in mind the creation of service to the community, and the reward for this service will come as a natural consequence. The gas-supply industry has responsibilities imposed upon it other than mere profit-making. Mark this excerpt from the Presidential Address, and its message: "Parliament has "given your undertaking a monopoly right to supply gas in "your district. Whether you are a sliding-scale company, "or a maximum-dividend company, or a municipal under-"taking, the public rights you possess impose upon you a "public duty—that of supplying gas in your district at the "lowest possible price consonant with your other obliga-"tions." The lowest possible price can only be attained through the expansion of the volume of gas sold to the point where advantage ceases in its use for domestic, public, and industrial purposes. We heard much during the proceedings as to the advantage to the community of the creation of a purer atmosphere, of cleaner conditions in the home, of convenience in the dwellings of the poor, and much else. The fact is we are only on the threshold of the newer developments in service of the gas industry; and the best machinery for urging forward these developments is found in the Association, whose voice can reach those whom it is desired should know more of the advantages of gas, and who should have cleared from their minds the misconception that has been all too long allowed to dwell there through the want of systematic and accredited attack upon it. The organization is meeting with large acceptance and credit; and the industry must not lose hold of the power it has created and is still creating. Sure as the industry allowed the destruction of this organization with all its operative power, so surely would the enemies of gas supply take advantage of the loss to set up something to further impair the strength of the industry.

These are no idle words. The Association has grown and has established itself in the work of the industry. It is sowing the seed of future prosperity. But it is not supported with the unanimity that is desirable. Nearly 260 gas undertakings are enrolled, and the number comprises the majority of the important concerns in point of magnitude. But the Association desires that all should come in. Among the subscribers are Manchester and Salford (the Corporations of which city and borough were the courteous and generous hosts of the Association last week), and several other Lancashire and Yorkshire concerns are entered on the roll of membership. Lancashire and Yorkshire boast of their long-headed men of business; and the rest of the country knows this is not a mere legendary boast, but is a fact. Thinks any reader that these men would subscribe to the Association if they thought there was not tangible advantage for the gas industry and the community in its constructive work. We have no doubt whatever as to their views after hearing, as we did last week, the pronounced declarations on the subject of the Lord Mayor of Manchester, the Mayor of Salford, and Mr. Councillor Kay and Mr. Alderman Phillips, the respective (and respected and energetic) Chairmen of the Manchester Corporation and Salford

Corporation Gas Committees. If all members of Gas Committees and of Boards of Gas Directors possessed a like robust faith in co-operation in the prosecution of work to advance the interests of the industry, and in that advancement doing greater service for the community, the organization would soon become one of the strongest industrial bodies in the United Kingdom.

We cannot pass from this general article without saying how much the success of the first annual meeting is due not only to the charming and genial hosts in Manchester and Salford, but to the President for the graceful, tactful, and dignified manner in which he conducted the proceedings, to the Chairman of the Executive Committee (Mr. F. W. Goodenough), whose energy was colossal, to the Editor of the Association's publications (Mrs. M. A. Cloudesley Brereton), and to the Secretary (Mr. Walter M. Mason). All worked well; and all fully deserve the encomiums they received for their labours.

Development of Association Work, and of Gas Business.

If the papers treating of the development of the work of the British Commercial Gas Association and of the gas business, which were read at last week's meeting, are taken *en bloc*, and are considered in their relative bearings, instead of detracting from interest, interest is thereby intensified. The paper by Mr. H. James Yates gives the starting-point to this line of consideration. He states the case why all concerns that are units of the gas industry, and that make their profits in any way through the gas industry, should belong to the Association. He is a strong and enthusiastic believer in co-operation for developing the work of the industry; and at the risk of abusing personal confidence, it may be said, with a fair amount of assurance, that his belief would carry him farther still in assisting in any commendable development of the gas co-operative system. There is not the slightest doubt that, with qualification, he agrees, as we all agree, with one of the philosophic remarks in Mr. A. F. Sheldon's address at the meeting, on "The "Science of Building any Business." That remark was: "There is more of efficacy in co-operation than in competi- "tion." That is true in the broad sense; but co-operation cannot displace all competition. For economic reasons, it is a good thing that it cannot. And in the particular connection with which the gas industry is concerned, we find (without particularly entering into explanation) that competition begets co-operation, and makes the latter a highly essential feature in procuring commercial expansion, through such means as Mr. Yates first tersely presents, and then expatiates upon. Stated briefly, the co-operative work that the Association has in hand is to make gas better known to the public; to remove prejudice and misconception; to offer expert advice; and to give assistance in developing local activity, and in dealing with emergencies. All this, without interfering with ordinary local means of developing business. Mr. Yates's paper should be read in conjunction with the Presidential Address and the report of the General Committee (both of which were published in our columns last week); and all gas undertakings and other concerns making a living out of the gas industry will find ample reason in them as to why they should come to a prompt decision to participate in co-operative work. Their abstention from participation places upon the Association bounds beyond which there is other work to be done; their participation would give the Association more latitude. But further on this point presently.

We are not prepared to apply to the local work of gas undertakings the meaning, in its fullness, attaching to the ancient dictum that "a prophet is not without honour, save "in his own country." But the fact remains that there are laymen who look upon the propaganda work that a local gas undertaking does with much the same feeling as they would entertain towards a man who boasts of his own qualifications and accomplishments. Yet these same laymen will give heed to anything coming to them from an organized body of recognized and authoritative position. Such bodies, too, have often influence among people themselves possessing influence, where local effort may perhaps fail through not being properly equipped for dealing with them. One of the purposes of the Association is to fill the measure of systematic publicity and educational work; and to step in where local effort, however good, is deficient. Mr. Yates says that among the objects of the Association is the one of making gas better known. The fact that local gas enterprise has still such a large field of business of which to enter into possession shows that the methods hitherto applied have not—good as is the business done—succeeded to the fullest degree. The work of the Association, however, is auxiliary to these local efforts, and by no means does it claim to displace them. Every gas undertaking must, for instance, have its show-room or show-rooms; and these places must be on the modern lines adumbrated in Mr. George Clarry's interesting paper. The show-room must be a centre of attraction. It must, as Mr. Clarry says, be situated in the best trading part of a town; it must be a place that has external attractions causing it to project into particular notice from the midst of its business neighbours; and it must be a place equipped internally for all sorts of demonstration work, so as to show what can be done. A gas show-room must be a place *de luxe*. There must be no niggardliness practised in connection with the show-room; and why? Because, as Mr. Clarry shows, it pays to practise the contrary. But there is another point about the show-room. It is that there must be in every show-room the fully qualified salesman. Just any man will not do. Salesmanship, as Mr. Sheldon said in his address at the meeting, is a science and an art. The salesman must be able to create business; he must be able to read his prospective patrons; he must be able to make profitable and permanent business; he must know his own business; he must know his competitors; he must know his competitors' commodities; and he must be able to apply the knowledge. Mr. Sheldon's address should be read by all having show-room attendants, or who have to select them. One of the points this philosophic guide makes is that the gas salesman, if he is to show proper efficiency in his work, must know "the other fellow." That is a matter upon which we have frequently insisted; and it was the deficiency found in this respect that supplied one of the promptings to the compilation of the recently issued book "Competition Points for Gas Salesmen." This show-room work is beyond the scope of the Association; and it must be carried to demonstrative perfection by every gas undertaking—company and municipal. The Association goes beyond the show-room, and operates, in various ways and directions, to reach the people that such and other local effort does not attract or convince.

Another point in Mr. Yates's paper was that the Association wields influence, and can operate, by educational means, in removing prejudice. This statement hinges upon the paper by Mr. H. H. Creasey. In this was described the character of the campaign, in connection with domestic gas heating, that the author has conducted, under Mr. Goodenough's direction, among the doctors in the supply area of the Gaslight and Coke Company; and the author must be congratulated upon the results. One of the best advertising mediums for gas heating of which we know is the doctor. He has to be convinced that the defects of the old-type gas-fire have been removed; and once he is satisfied that pure radiant heat is available from the gas-fire, and that the gas-fire, without detriment to its heating efficiency, is a good ventilating agent, he becomes one of the staunchest friends of the gas vendor. Through the special painstaking work there has been in the Gaslight area, there were, at the end of last heating season, no less than 2484 medical men using gas for heating out of a possible total of 4012. The former is a figure of import. We realize what a potent force the figure is in favour of gas heating throughout the country. It is a figure that can be used everywhere with effect. We can see the amazed look, when confronted with the figure, on the face of the advocate of electric "heating" who has, as a last resort in trying to persuade a householder to purchase expensive heat units, told him to walk round to his doctor, and ask him what he thinks of gas-fires. However, we like this paper by Mr. Creasey; and we hope the Association will secure, for the annual conferences, other men who are actually doing special work to impart their views and experiences. As the paper is read, we see the warning that for campaign work of this description specialists and men of diplomacy are required. All gas undertakings have not the scope for employing specialists full time; and during the proceedings there were suggestions that the Association should act as a sort of agency for expert men and women (the entry of the names on the Association register being a guarantee of qualification and all else that is essential) who could be engaged for temporary or periodical service, to act as expert canvassers or inspectors, to obtain business and give advice, and report to the gas-supplying authority. Such extension

of the Association's work would not cost much. But it would impose additional duty on the staff.

The suggestions that the papers and discussions produced for the extension of the operations of the Association were remarkable; and the fact that there is so much work to be done, in addition to that already in hand, accentuates the need of the organization. We have the suggestions as to expert canvassers and inspectors. Complaint was also made that some of the big Metropolitan stores only keep antiquated gas-fittings (this we opine is an effect of the show-room work of the Gas Companies); and it was suggested that the Association might arrange inducements for the stores to modernize their practice in this particular. There was a suggestion that the Association should have a technical and scientific man on the staff. The General Committee, in their report, hinted that a good opening exists for work in special technical research relating to gas utilization, with publication of the results to subscribers. Mr. Yates, too, wants to see the Association with a laboratory and test room for testing gas appliances, and placing upon them the "hall mark" of the Association if standards of efficiency were satisfied. Although we want the highest efficiency in gas appliances, this is a suggestion against which we should be prepared to take up an antagonistic attitude. No such work could be performed by any single organization in the industry, without placing it in an invidious position. All three organizations might work out a scheme for gas appliance testings by some firm or body independent of them, and reliable and honourable; but one of these bodies could not possibly take up such work without discontent and division resulting.

It is interesting to have these suggestions. They indicate an appreciation that the Association is filling a useful place in the industry's commercial machinery. But it would be unwise to attempt to extend work at too rapid a rate. Better only do what is already in hand, and have that done well, than expand it before the Association are fitted for additional work. There can be expansion. But expansion depends on additional revenue; and additional revenue upon new subscribers.

Coke Sales Development.

It follows as a natural consequence that the more coal gas that is sold, the greater the amount of coke produced for disposal, although there is the consolation that the production of coke has not of recent years proceeded with *pari passu* consistency with the sale of gas, owing to the greater production of gas per ton of coal under improved methods of carbonization. Mr. J. Ferguson Bell, however, is of the opinion—an opinion expressed with force in the paper he read before the British Commercial Gas Association—that the gas industry should, in view of the developing uses of gas, seriously consider the question of creating further profitable demand for the premier of its secondary products. He (like Mr. Thomas Glover, in his Institution Presidential Address of a time ago, and like other readers of papers on this subject) is of opinion that sufficient attention is not paid to coke quality and preparation to make it so fully attractive as it might be for local needs and consumption. This point, we may parenthetically remark, brought from Mr. R. S. Hilton the statement that at Birmingham, in order to meet the demand for metallurgical coke, coke-ovens have been installed by the Corporation Gas Department. In this, as in other things, the Birmingham Gas Department has studied local needs. That is as things should be. But on the general subject, Mr. Bell asks, "Why is coke not more "generally used?" There must, he says, be "some tangible "reason." We rather think the only tangible reasons are want of education, the question of the quality of coke, and the fact that, if householders give up solid fuel at all for any purpose, it is generally for the more convenient gas supply, which entails no labour preparatory or subsequent to use. And really, while we know the importance upon gas prices of good markets for coke, we cannot say that we blame the householder for, on making a change, his choice of fuel in the gaseous form. It comes to this, that we cannot make people take coke; and the only thing a gas undertaking can do is to give them the choice of two commodities.

Experience, however, is that householders do not, as a rule, apply gas for all heating purposes. They are the losers in the matters of convenience and cleanliness. It is therefore where they retain solid fuel that there is the field for the exploitation of coke. But exploitation must be on just as systematic and demonstrative lines as those applied to the gas-heating business. We cannot understand why gas undertakings apply different methods in exploiting their two heating commodities. They go for the line of least resistance, to the neglect of the other. That is a mistake. There are lines in Mr. Bell's paper that are particularly worth marking. They are these: "For each ton of coal carbonized, "there remains for sale about 10 cwt. of coke and breeze. The "average gas consumption, in round figures, may be taken at "33,000 cubic feet per annum for each householder. This "necessitates 3 tons of coal for the production of illumi-"nating gas, giving 30 cwt. of coke and breeze for sale per "consumer (if a proportion of carburetted water-gas is made, "the quantity made is reduced to 20 cwt.), which is not "one-third the quantity of solid fuel required per householder "for heating purposes, without taking into account the tonnage "used for trade and industrial purposes. From this it would "seem that every gas undertaking irrespective of its geo-"graphical position, should be able to dispose of the whole "of its make of coke within its own area of gas supply." If they could only do so! However, the words are worth pondering over. But while coke commands present prices, the general question will be: "Why trouble?" The *laissez faire* policy is a very popular one under such circumstances. The thought-for-to-morrow policy is treated to procrastination. In commerce, as in other things, mistakes are plentiful. The best we can hope is that Mr. Bell's paper will bear fruit in obtaining greater consideration for the question of the development of coke use. The importance of the question cannot be gainsaid.

Hygienic Aspects of Gas Lighting and Heating.

Through the latter centuries, there have been spasmodic study and opinions expressed by scientific observers as to the qualities of the atmosphere that are, under the conventional conditions of human life, such as will not impair health; but it is only within recent years that there has been any settling down on grounds that have become, it may now be fairly said, incontrovertible. Brilliant intellects—the possessions of men of unassailable independence—have examined into the matter; and equally brilliant intellects have investigated the new work and its results, without detecting flaws. So a new chapter of hygienic belief has opened up in this direction; and the incorporated credentials have, where openness of mind exists, swept away all mistaken notion. No longer does mere observation or traditional or arbitrary view hold in this matter; but measured compositions and effects dominate the belief of to-day. It is true the scientifically rejected theories of old are still accepted—with the risk of others questioning the mental balance of those who accept them—by those competitors of the gas industry whose commercial and competitive methods, nescience and baseless theory, fit better than something of a more substantial character. If they look round carefully, they will find that their dearest weapons are nothing more than the absurdest of scientific heresies, and that they alone to-day give support and circulation to them. Not only so, but the latest independent scientific evidence as to the atmospheric requirements for healthy conditions show that these conditions are promoted by the use of gas for lighting and heating; that they are not promoted by the employment of electricity for these purposes; and that electricity requires some auxiliary mechanical means to supply its deficiency in comparison with the ventilating energy possessed by gas. Even then, as testimony from various quarters—including the Institution of Electrical Engineers—shows, the work of ventilation is not performed so efficiently as by the natural power possessed by the gas competitor. It comes to this, that the very weapons electricity people have, in error and ignorance, or with contempt for scientific truth, been using against gas can now be turned against electricity, with (this electricity never possessed) scientific endorsement.

The powers that be in connection with the British Commercial Gas Association did the right thing in arranging for a lecture by Professor Vivian Lewes, on the "Hygienic Aspects "of Gas Lighting and Heating," to be delivered during the conference. It was a great success. It served as a supplement to the first annual dinner at which there were a number of distinguished local guests representing civic life and science and art, and to the reception of a number of ladies distinguished in municipal, medical, health, and educational work in Manchester. Professor Lewes adapted both his manner and his matter to the occasion. There was a task of

enlightenment to be performed, and he performed it. Professor Lewes showed how erroneous notions had obtained credence—in modern times, more or less heartily according to the commercial needs of those who accept the false notions, or profess to do so. Latter-day investigation has shown that it is not the chemical composition of the air so much as the correct temperature and humidity, as well as the movement, of the air in rooms that gives us sanitary living conditions. Both Dr. Leonard Hill and Dr. Haldane have found that from 3 to 4 per cent. of carbon dioxide in the air of rooms has no effect except to deepen the breathing of the persons in it; and it has also been demonstrated that the oxygen of the air may be reduced to 17·5 per cent. without interfering with the ordinary functions of life. There is no answer to such scientific facts; but there is scientific condemnation of stagnant air, and air charged with organic matter that is not dissipated by any means of air movement and removal. As Professor Lewes points out, Dr. Haldane and others have confirmed the view that the organic matter thrown off from the lungs and skin of *healthy* people is not deleterious. The qualification as to people being healthy is the important part of the statement, for it is difficult for an ordinary person to discriminate as to who is, and who is not, a really healthy person in any place in which a number of people are assembled. Therefore, it is better to be on the safe side; for, while chemical composition may not very much matter, stagnant air does, and so do the respiratory emanations from an unhealthy person. Professor Lewes carried us over the ground on which has been proved that, among the illuminants, gas holds fore place in promoting sanitary atmospheric conditions. All he had to say is well known to those who have made a study of the matter; but he put the case, and demonstrated his points, in a way that all might understand. In this purpose he was successful. It is remarked that the result of modern investigation has torn away a large part of the irreconcilable attitude that Professor Lewes once evinced towards the flueless radiator for use in large interiors such as workrooms. His lecture shows a way in which he thinks they can be used for quickly flooding factory workrooms with warmth; so promoting the conditions of comfort that are essential to the worker, if the highest efficiency is to be secured from him.

Experimental Street Lighting in Manchester.

WHILE in Manchester last week, the opportunity was taken of making an inspection of the experimental central gas and electric lighting that has been recently under test; and, on our part, there is disappointment with the whole display. It is not in the least what we expected; and if any decision as to future street-lighting is come to upon any illuminating power tests made with this demonstration, the whole business ought to be treated with contempt. The electric-lamps are centrally hung in Portland Street, and the high-pressure gas-lamps are centrally suspended in Princess Street. Here at once there is cause for complaint. We do not know who was responsible for the disparity that is observable in the extent of the two demonstrations; but the fact remains that the Electricity Department has been hoping to carry the day by suspending (we think we counted correctly) fourteen high-power arc lamps in the centre of Portland Street, while the demonstration gas lighting is modestly, and almost apologetically, represented by only four three-burner high-pressure lamps in Princess Street. If it was intended to have a really effectual comparative demonstration, it ought to have been on lines at least of numerical equality. As it is, the high-pressure gas-lamps do not seem to be giving nearly such good illuminating duty as two-burner gas-lamps in the streets of London. It appears to us that there must be some local defect in these lamps—not to be giving for three burners a larger volume of light than these are doing. We have no knowledge as to whether the Gas Department is deficient in technical strength in its outdoor department; but certainly these high-pressure gas-lamps do not satisfy us that they are doing their best, applying the gauge supplied by similar high-pressure lamps in London and elsewhere. Irrespective of volume of light, the quality and distribution of the light are excellent.

The arc lamp lighting in Portland Street is about the crudest piece of work that we have ever seen in street illumination. What has obviously been done here has been to endeavour to obtain the greatest possible volume of illuminating power from these defective distributors of light, and to sacrifice quality of illumination and all illuminating effect. Every canon of illuminating engineering has been abused for the sole purpose of securing volume of light. Here we have high-power flame arc lamps with plain, instead of opaque, globes tormenting the eyes by the harshness of the light and the flickering source; and to give the public some slight protection from the fearful glare (this alone shows the recognition of the effect of the abuse of scientific illumination to which they are subjecting the citizens), the Electricity Department has suspended the lamps, we should calculate, about 30 feet above the road surface. If the reports of the experts have not dealt with this aspect of the lighting by these flame arc lamps, the reports will not be doing full justice from the public standpoint. The illumination of the road surface under these lamps is sharply patchy—the shadows being quite dense in places. This further defect has evidently been recognized by the Electricity Department, for three or four of the lamps have been fitted with reflectors, to throw the light downwards, and thus minimize the shadows. But what is the result? There was a slight fog when our inspection was made on Monday evening last week; and where these reflectors were in use a perfect archway was formed by the dense top shadow. The effect is most depressing; and as an illustration of a bad piece of high-power lighting, it could not be exceeded. To pass from the electrically lighted street, with the dazzling, harsh light coming from the arc lamps fitted with plain glass globes—a condition any illuminating scientist who had not a part to play would severely condemn—is a restful experience. There is quality of lighting here; and the effect is pleasant. But in all our experience and study of scientific illumination, worse characteristics in high-power lighting of any kind have never come under our notice than were found with the flame arc lighting in Portland Street. Whatever the source of light, do let us have in our streets quality of illumination as well as volume of light.

New South Wales Gas Regulation Bill.

There was an unusual scene in the New South Wales Legislative Assembly on the evening of the 4th ult., when the Gas Regulation Bill introduced by the Government, to which several references have been made in the "JOURNAL," was to be debated. As mentioned last week (p. 123), the Bill was read the first time on the 8th of August, and the Minister responsible for it was urged not to hurry it through, as it was very important that members should have ample time to consider the details. The unusual scene referred to was the appearance at the Bar of the House of three barristers who had been permitted to state the cases on behalf of the Companies specially concerned—viz., the Australian, North Shore, and Newcastle Companies. No such spectacle as this has been witnessed in our own House of Commons; and though there have from time to time been "scenes" between the Speaker and one or more honourable members, leading to the suspension of the latter, the trouble has not been brought about in consequence of the presence, in his professional capacity, of an advocate of a particular measure. It was so, however, on the occasion referred to. The report which appears in another part of the "JOURNAL," for which we are indebted to the "Sydney Morning Herald," furnishes a full account of the proceedings. It was only right that the Australian Gaslight Company, as the largest of the Companies affected, should be allowed first to put their case before the House; and this was ably done by Mr. Adrian Knox, K.C. His statement was a clear and well-reasoned one which all could follow and understand. It was necessary, for supporting his arguments, that he should refer to gas companies in England and the legislation controlling them; because all three Companies are willing to submit to any regulations similar to those in force here. But the Speaker would not allow Mr. Knox to proceed, and ordered him to confine himself to the business side of the question. Counsel urged that the major part of his argument would have been based upon a comparison of English legislation with that which was now proposed; but, in deference to the Chair, he would say nothing more about it. There was a united outburst against the Speaker's interference, which was received with cries of "Shame." The Premier, on behalf of the Government, appealed strongly to the Speaker to allow Counsel the widest scope possible. His appeal evoked the commendation of the Opposition benches; but it was in vain. Counsel, finding he was not allowed to follow up his line of argument, said he could not usefully detain the House longer. It was a sudden and

unexpected ending; and there was an evident feeling among the members that he had not had fair play. Counsel for the two other Companies submitted their cases; and then followed a debate which was continued till too late an hour to be reported in the edition of our contemporary from which the account of the proceedings given elsewhere was taken.

Result of the Gas Inquiry at Melbourne.

In the course of the proceedings at the last half-yearly meeting of the Melbourne Gas Company, as reported in the "JOURNAL" for the 1st inst. (p. 50), reference was made to the searching investigation into the affairs of the Company carried out by the Gas Inquiry Board appointed by the Government. The sittings commenced on the 28th of February and were continued till the 28th of June. We have received a copy of the report, with the evidence, &c.; and it is a very voluminous one. It is somewhat drastic, and goes much farther than might have been expected from the evidence. Its chief feature is a recommendation that the Company's standard price should be reduced from 7s. to 4s. As this suggested alteration does not carry with it any concession to the Company or the shareholders, it is without precedent in the gas industry, except, perhaps, that of the New South Wales Gas Regulation Bill, previously referred to. The Board have further come to the conclusion that it would not be profitable for the Municipalities to buy out the undertaking on the basis laid down in the Company's Act of 1878. Consequently, they recommend, in addition to the sweeping reduction in the standard price, the repeal of the clause relating to purchase, and the substitution of one which is designed apparently to allow the Municipalities to buy on a much lower basis. In support of the recommendation to municipalize the concern, attention is drawn to the fact that the average price charged for gas by the Municipalities at home is 2s. 6d. per 1000 cubic feet, compared with 2s. 9d. by the Companies. These figures were taken from statistics in the "Municipal Year Book," and the Company's Engineer (Mr. Philip C. Holmes Hunt, M.Inst.C.E.) endeavoured to show in the course of his evidence that, as an argument for the municipalization of a concern of the size of the Melbourne Company, these figures were misleading. The Board, however, ignored all that was said on this point. What the Government intend doing in the matter has not yet been made known; but it is anticipated that they will endeavour to do something during the present session to amend the Company's Act. According to some recent comments in the Money Article of the "Sydney Morning Herald," the proposals of the Board will, if carried out, reduce the Company's profit by nearly one-half. Up to the end of June the price of gas in Melbourne was 5s. per 1000 cubic feet, and on this price the revenue for gas for the half year was £266,349. The price is now 4s. 7d.; and, as mentioned, the Board propose 4s. This would mean a decrease of £53,270 in the gas revenue upon last half-year's sales. The net profits for the past six months were put at £109,437. A reduction of 1s. would have meant a net profit of only £56,167. This subject is so important as to call for fuller treatment in an early issue.

Economies in Gas-Works.

A good beginning to the present session was made on Saturday by the Midland Junior Gas Association, who assembled—though, perhaps, not in quite such large numbers as could have been wished—to hear their new President (Mr. F. Shewring) deliver his Inaugural Address. Being in full control of the Droitwich Gas-Works, Mr. Shewring finds it necessary, like other gas managers, to be a man of many parts. That is to say, he has to give his attention to all matters connected with the undertaking; and, as a result, he was, in the course of a thoroughly practical address, able to bring before his hearers a number of suggestions regarding different matters connected with the manufacture and distribution of gas—his idea being to give as many members as possible (there are, of course, various branches of the industry represented in the Association) something to interest them. The importance of small things in relation to a business that is carried on, like the gas industry, on a big scale, is a point that has always impressed itself upon Mr. Shewring; and, having in mind more particularly small or medium sized undertakings, he indicated several matters which he regards as being conducive to economical working. In fact, the address was mainly a record of personal experience; the "wrinkles" that he gave having been tried by him, and not found wanting—a consideration which imparts additional value to what he had to say. In his preference for the use of good quality steam-pipe for services, it will be noted, Mr. Shewring was cordially supported by Mr. Adam Cooke, of Oldbury (the President this year of the Midland Association of Gas Managers), who was present at the meeting. The closing paragraphs of the address were devoted to the question of the disposal of sulphate of ammonia. The President has in mind the possibility of new discoveries being made to recover still more of the nitrogen in the process of coal carbonization, and foresees the time when medium and small gas-works will not be satisfied with results lower than those attained by the bigger concerns. This will mean a larger quantity of sulphate of ammonia for disposal, and to the provision of a market for it he urged those concerned to turn their attention. Mr. Shewring is fortunate enough, by perseverance, to have succeeded in getting rid of the whole of his output locally; and this is an example that others who do not so dispose of their make might strive to emulate—though it is evidently a matter into which the question of locality must enter largely.

Benzol for Driving Motor Cars.

In another part of the "JOURNAL," reference is made to a communication recently addressed to the Editor of "The Autocar" by a correspondent associated with the Mitchell Main Colliery Company, Limited, calling attention to some results obtained by the Company in driving various classes of motor-cars with benzol manufactured by them. In a circular accompanying the letter, particulars were given of the runs, and the distances covered per gallon of spirit used; and these are reproduced elsewhere. The point raised by the correspondent was whether, if the Company could achieve the results set forth, local authorities owning gas-works, and using benzol for their own purposes, could not be prevailed upon to assist their ratepayers who are users of motor spirit in obtaining supplies at a reasonable figure, and help to meet the present "squeeze" in the price of petrol. Commenting upon the matter, the Editor of the above-named publication pointed out that benzol is perfectly suitable for motor driving in place of petrol, only it requires a larger proportion of air to be mixed with it. He regarded the suggestion as an extremely practical one. In the first place, it would overcome the difficulty of distribution, as it would be perfectly easy for a motorist living near gas-works to obtain supplies; and, secondly, if a regular demand were created, it would pay the owners of the works to take steps to meet it. This would not only be a convenience to the motorist, but would encourage home industries. Each user of a motor-car who is interested in this matter is advised to bring it before the manager of the local gas-works with the view of ascertaining whether or not some arrangement cannot be made with him for obtaining a supply of benzol. Our contemporary remarks that such a proposal as that thrown out would have been hopelessly impracticable a few years ago. But motoring has now become so general that it is thought that in only very exceptional cases will gas-works officials decline to entertain the suggestion. In these, probably a little "courteous persistence" will, it is believed, work wonders. At all events, we direct attention to the matter in order that readers in charge of gas-works may not be surprised if they are approached with reference to it.

Local Government Finance.

There has now been reached—after the issue of at least one of the volumes for the succeeding year—the last of the series of Blue-Books constituting the Local Taxation Returns for the financial year 1909-10. This is Part VII., and it comprises the summary and index. An early opportunity will be taken of dealing with some of the figures contained in the summary; but meanwhile it may be remarked that particulars are furnished with regard to 25,403 separate authorities who had financial transactions during the twelve months to the end of March, 1910. Figures are given over a period of years, which renders it easy to see how matters are progressing. Taking first the outstanding loans, it is seen that in the interval between 1899-1900 and 1909-10, these have gone up from £292,947,016 to £536,002,529, though the last-named figure includes a sum of £49,529,222 for the Metropolitan Water Board. The amount provided during 1909-10 (otherwise than out of borrowed moneys) for the repayment of loans was £13,892,510, which is equivalent to about a thirty-sixth part of the total loans outstanding at the commencement of the year.

The increase in the amount of outstanding loans (£6,867,810) was smaller than any annual increase between the years 1891-2 and 1909-10. This is excluding £22,570,459 received by the Port of London Authority. Loans to the extent of £41,989,630 were raised during the year, including the sum just mentioned; but apart from the loans received by the Port of London Authority, the total amount raised by local authorities in the year under review was £19,419,171—which sum was smaller than the amount raised in 1908-9 by £1,230,521, and less than the corresponding amount for any year since 1897-8. Of the total loans outstanding, 52 per cent. is on account of revenue earning undertakings. The average sum per pound of rateable value of loans outstanding increased from £2 7s. 7d. in 1908-9 to £2 9s. 9d. in 1909-10; and per head of population, from £14 8s. 8d. to £15 2s. 7d. The average amount per pound of valuation of public rates raised has risen from 6s. 1·19d. to 6s. 2·62d.; and per head of the population, from £1 14s. 11d. to £1 15s. 9d. The total amount received from rates has grown from £61,273,458 to £63,260,940. In the period between 1899-1900 and 1909-10, the amount of outstanding loans on gas-works has increased from £19,819,301 to £23,247,552; and for electric lighting, from £7,853,061 to £29,542,515. The receipts from gas undertakings have gone up from £6,035,526 to £7,484,429; and from electric light undertakings, from £910,329 to £3,663,015. The total receipts have risen from £77,202,175 to £126,908,622. The rateable value of the property assessed to local rates was £175,622,758 in 1899; and in 1910 it was £217,180,184. The National Debt stood at £762,463,625 in 1909-10, as against the £536,002,529 of outstanding loans of local authorities.

Sulphate of Ammonia and Beet.

It will be remembered that the Sulphate of Ammonia Committee have extended assistance to the experimental work in beet growing, and the establishment of the beet-sugar industry in this country, by supplying sulphate of ammonia for the purpose of fertilizing trial lands. In view of this, and the important relation the scheme has to the provision of a new opening at home for sulphate of ammonia, it is of interest to read the excellent optimistic character of the speeches made on the subject at the first annual meeting last week of the Incorporated English Beet Sugar Pioneer Association. The Council have reason to be more than satisfied with its achievements, said the Chairman, Mr. E. Russell Taylor. The trials have proved that sugar beet can be grown in this country, that the climate and the soil are suitable, that the roots contain a saccharine substance equal to any Continental beets, and that its weight per ton of beets, equals, if it does not surpass, that of any other country. It is believed that by producing beet sugar nearly a million acres of land could be brought under cultivation here, and give employment to thousands of people on the land and in the sugar factories. The farmers of Cornwall, in addition to the farmers in Norfolk and neighbouring counties, have been carrying out trials; and they have sold the beet at good prices on the Continent. These Cornishmen are not going to be behind any other counties in this matter; and they have already selected a site for what they hope will be the first beet-sugar factory in the country. If the pioneers in the work of planting a new industry in this country get proper encouragement, they intend to stop the flow of money abroad for something which can very well be grown at home.

Personal.

Mr. John Ireland, the Manager of the Auchterarder Gaslight Company, has been appointed Manager of the Moffat Gas-Works, out of a large number of applicants. Mr. Ireland has been Manager at Auchterarder for nearly six-and-a-half years.

From a large number of applicants in response to the advertisement which appeared in the "Journal" some weeks ago, Mr. A. R. Barton, of Bournemouth, has been appointed Chief Draughtsman at the gas-works of the Salford Corporation.

The position of Manager of the gas-works at St. Louis, in North Brazil, having become vacant by the resignation of Mr. T. D Obering, who is returning to England, Mr. William Ewing, the Engineer and Manager of the Lochgelly Gas Company, has been appointed as his successor. He will leave England about the middle of next month to take up his duties, and be accompanied by his son, who will be his Assistant. Mr. Ewing was engaged at the Parà Gas-Works; and he was Gas Engineer and Manager to the Corporations of Hamilton and Greenock.

INSTITUTION OF GAS ENGINEERS.

Proceedings of the Council.

A meeting of the Council of the Institution of Gas Engineers was held at the Manchester Town Hall, last Tuesday—the President, Mr. Corbet Woodall, J.P., D.Sc., in the chair.

Before entering upon the ordinary business of the meeting, it was resolved that the cordial congratulations of the Institution should be tendered to the President, to Mr. Charles Carpenter, and to Mr. Thomas Newbigging, on the honour of the degree of Doctor of Science which had been conferred upon them by the University of Leeds.

The subject of the constitution of the International Commission on Photometry was introduced; and it was reported that further communications with reference to it would probably be ready for putting before the Council at their next meeting.

Arising out of the report on the education and certification of gas-fitters, which had been adopted at the last meeting of the Institution, a Committee of the Council was appointed to approach the Department of Technology of the City and Guilds of London Institute in regard to the suggested introduction into their syllabus of a new subject for examination bearing on the matter.

Letters were read from the University of Leeds advising the Council of the appointment of Mr. John William Cobb, B.Sc. (London and Leeds), to the Livesey Professorship of Coal Gas and Fuel Industries, in succession to Professor Bone; and with reference to the Institution Research Fellowship (to which a new Fellow would be shortly appointed), expressing the thanks of the Council of the University for the Institution's assistance in that department of the University's work.

Some consideration was given to the preliminary arrangements for the jubilee meeting next year, the provisional date for which was fixed for Tuesday, June 17, and following days.

The report of the Provisional Joint Committee of the Gas Exhibition which is to form one of the features of the programme for celebrating the jubilee of the Institution was then presented, announcing the decision to hold the exhibition in the month of October, at Shepherd's Bush. At a meeting of representatives of gas undertakings, manufacturers, and others supporting the movement, held the previous day, full particulars of the general plan of the exhibition were submitted, an Exhibition Committee was formed, and an Executive Committee elected to carry out the detailed work of organization.

The Institution's representatives on the Committee charged with the duty of discussing with the Inland Revenue Authorities questions relating to depreciation and income-tax applying to gas companies' undertakings presented their report, which was accepted and adopted. It included a scheme for determining the income-tax allowances to be granted for wear and tear and for maintenance which had been approved by the Board of Inland Revenue, and which the Committee recommended for adoption by the gas companies of the United Kingdom.

The report of the Parliamentary Committee on what they had done since the meeting of the Institution in June in opposing the action taken by the Alkali Manufacturers' Association against Gas Bills in the last session of Parliament was presented. They reported that arrangements had been made for the subject to be laid before a Committee of both Houses, so that the representations of the Institution on the subject on behalf of the industry would be fully considered.

The Institution's representatives who attended the meeting of the Dutch Association of Gas Engineers at Amsterdam, on the occasion of the International Gas Exhibition there, reported on their visit to the exhibition and to the new gas-works of the Municipality of Amsterdam. They referred in appreciative terms to the cordial way in which they had been received, and to the interesting programme which had been provided. A resolution of thanks was passed to the Dutch Association for the kindness they had shown.

The financial statement relating to the Institution in account with the British Commercial Gas Association for the year ended the 30th ult. was presented, accepted, and adopted.

Reference was made to the Kelvin Memorial Fund for the erection of a window in Westminster Abbey, to the memory of Lord Kelvin, in which the Institution had, with other engineering societies, been invited to participate.

A vote of thanks to the Manchester Corporation for their kindness in granting facilities for holding the Council and Committee meetings at the Manchester Town Hall brought the proceedings to a close.

Obituary.

Mr. Graham Ross, the Superintendent at the works of the Altrincham Gas Company, whose death from pneumonia took place recently, may be said to have been cradled in the gas business, for his father and grandfather before him were gas engineers at Stonehaven. It was at the Tradeston Gas-Works, however, that Mr. Graham Ross received his early training; and he gained further experience at Baslow. In 1897, he was appointed foreman at the Altrincham Gas-Works, and some years ago was promoted to the post of Superintendent; this being the Directors' reward for faithful service. Mr. Ross was in his fortieth year, and was a member of the Manchester Junior Gas Association.

THE BRITISH COMMERCIAL GAS ASSOCIATION.

FIRST ANNUAL CONFERENCE—MANCHESTER, OCTOBER 8 and 9, 1912.

CORBET WOODALL, Esq., J.P., D.Sc., M.Inst.C.E., President.

FIRST FRUITS.

"Glad say Chairman and Committee converted as result magnificent meeting. Have decided to subscribe.—Taylor, Mossley."

This is a copy of a telegram to the British Commercial Gas Association that preceded a letter from Mr. C. O. Noel, Chairman of the Mossley Corporation Gas Committee, and which has been forwarded to us for publication by Mrs. M. A. Cloudesley Brereton. It appears on p. 226.

NOTES AT THE CONFERENCE.

EVERYTHING favoured; and the first annual conference of the British Commercial Gas Association has been a royal success. "A good send-off" was a phrase that had large currency through the first three working days of the past week in Manchester and Salford; and both Manchester and Salford will ever be remembered with profound gratitude for the warm-hearted manner in which they helped the British Commercial Gas Association to celebrate their first anniversary, and to, by generous countenance and support, enable the Association to take position in public places as a live organization, with commercial aims and purposes of high and legitimate order. There is only one complaint to make of Manchester. Extensive as its hotel accommodation is, the entrance into the city of the delegates to this anniversary celebration and conference assisted to strain to breaking-point the power of accommodation. Those who secured hotel room were those who applied early; those who had to scour the city for places to lay their heads were those who had put their trust in the Manchester hotels to, at any minute, provide for man's necessities. However, full as was Manchester, every delegate—some not till late on Monday night—was comfortably lodged, and compensation for any dislocation of personal convenience and comfort was found in the proceedings during the ensuing days.

Early Arrivals and an Absentee.

Many of the delegates reached Manchester early on Monday. The President (Mr. Corbet Woodall, J.P., D.Sc.) was there betimes; and so were the indefatigable and irrepressible Chairman of the Executive Committee (Mr. F. W. Goodenough), Mr. Edward Allen, the Senior Vice-President of the Institution of Gas Engineers, Mr. R. G. Shadbolt, the immediate Past-President, Mr. John Bond, the Junior Vice-President, Mr. S. Y. Shoubridge, the Honorary Secretary, Mr. Walter T. Dunn, the Secretary, Mrs. M. A. Cloudesley Brereton, Editor to the British Commercial Gas Association, and Mr. Walter M. Mason, the Secretary. The Chairman of the Council of the Society of British Gas Industries (Mr. T. S. Clapham), the Vice-Chairman (Mr. W. D. Helps), the Hon. Secretary (Mr. Cyril G. Davis), the Hon. Treasurer (Mr. H. M. Thornton), and the Secretary (Mr. A. L. Griffith) were also among the early arrivals; and Mr. Councillor W. Kay (the Chairman of the Manchester Corporation Gas Committee), and Alderman F. S. Phillips (Chairman of the Salford Gas Committee) put in appearance early on Monday to give a personal welcome, apart from the formal one of the morrow. In the crowd we missed the face of one whose activity in these matters has made much gas history in the past—Mr. James W. Helps. More than ourselves missed him; his old collaborators in these matters—those who are near friends and have been fellow-workers—had a thought for him; the occasion and the events being just those in which he would have had a fervid delight. We guarantee, however, he was there in spirit, and will eagerly watch for the report of the proceedings reaching him where he is sojourning, a distance from these shores, recuperating his impaired health.

1913.

Take opportunity and have no waste time are among the private maxims of the active spirits of the British Commercial Gas Association. So many in Manchester, and not to take advantage of the shining hour to add more to the foundation work of the Institution Jubilee 1913 Exhibition was unthought of. So on Monday afternoon there was a conference on the subject of the great exhibition to be held next year. Men were there from all parts—the Institution, the Society of British Gas Industries, and the Commercial Gas Association were all represented, and therefore so were all the interests that comprise the gas industry. There was great enthusiasm throughout the proceedings. These are days of doing; and not days when the men of the industry sit inanimate as sacks of flour, and want an age almost to consider a business proposition. The old order changeth—rather has changed; and the President and most of the progressives of our administrations recognize the need of giving the new order scope and opportunity. The President's speech at the meeting called—opportunity offering—to consider the exhibition question concentrated in itself the forward policy. The statement by Mr. F. W. Goodenough showed the relegation of the old order of exhibition to the place occupied by back-numbers. Popular imagination has to be appealed to; and those who read the digest of the statement he made as published in other columns will see that, in the Shepherd's Bush halls that have been booked for the purpose of the exhibition, the public will be attracted by the novelty of the whole thing. New ideas have emanated from a new source—the picturesque, the refined, the practical modes of demonstration are to be found in a scheme plotted and planned by the Association's versatile Editor. Comprehensive and demonstrative will be this display; and its messages will be transferred by visitors to all quarters of the United Kingdom. Everything is in working shape now for prosecuting the matter. But it will cost money. The electrical industry not long since had its big show at Olympia; the gas industry is to have something big and more to the public taste at Shepherd's Bush next year. The question is, How can every undertaking—undertakings producing gas, and gas plant and appliances—throughout the industry help. The answer is—Subscribe, and that promptly.

Shoulder to Shoulder.

Tuesday morning saw the opening of the conference. The day itself wore that cheery aspect that was to be subsequently seen in the countenances of the Right Hon. the Lord Mayor (Mr. S. W. Royse), his Worship the Mayor of Salford (Mr. Alderman H. Linsley), Mr. Councillor Kay and Mr. Alderman Phillips, the Chairmen respectively of the Manchester and Salford Gas Committees. Welcome and enthusiasm were in the atmosphere. The way to the palatial home of civic government in Manchester could be traced by the groups of men on business intent, and with their packets of papers and invitation cards in hand, wending their way in one direction. In the corridors and lobbies of the Town Hall well before the opening of the business proceedings, there were hundreds of men from all places in the industry. We were to see more of what this meant presently when the individuals were assembled in the Lord Mayor's Parlour. The Lord Mayor and his civic colleagues received the members in a handsome room facing the main entrance to the parlour. Welcome was sincere; goodwill to the industry was everywhere. The capacity of the Lord Mayor's Parlour—extraordinarily big parlour that it is, with

on the walls the lifesize paintings of the men who have gone before, and who have contributed to the building of the city's greatness—was strained to the utmost. Looking round what the veteran gas campaigner, Mr. John West, later described as such a "mixture" of representatives of the interests in the industry has rarely, if ever, been seen. The broad policy has displaced the narrow one; locked doors have been unlocked; and the bricked-up channels that have prevented intercommunication have now been destroyed. Look round again, chairmen and directors of gas companies shoulder to shoulder with chairmen and members of corporation gas committees; gas engineers and secretaries shoulder to shoulder with directors and committeemen; the makers of gas plant and the makers of all domestic gas appliances shoulder to shoulder with gas directors, gas committee men, engineers, and secretaries. Why not? Interests are mutual. There is no idea of personal trade here; there is no mention of personal trade. They are left for other and appropriate occasions. All were bound together with the one idea of meeting those fundamental necessities that will advance and protect the mutual interests—interests that are indivisible, however much a past policy bids us continue to close our eyes to the fact. Those who were there, those who witnessed everything from beginning to end, were glad to see that a new era had now opened, were glad that the industry had amalgamated its forces, and had started on a new career to gain in strength and to maintain its position by co-operation.

A Presentation.

With all good wishes and blessings poured upon the assembly from civic lips representing large supperters of the Commercial Gas Association, the delegates settled down to business. First of all, there was the presentation of a framed, engrossed resolution to Mr. R. G. Shadbolt, who, during his tenancy of the presidential chair of the Institution of Gas Engineers, worked with heart and soul in the cause of the British Commercial Gas Association. Graceful words passed from the President's lips regarding the zeal and untiring energy of Mr. Shadbolt during his term of office; and Mr. Shadbolt took the kind things, sincerely expressed, upon himself with due modesty, and, with that unbounded good nature of his, he shared it all with his predecessor, Mr. Alexander Wilson, and the other officers who had assisted him in the work that time and good fortune brought before him for prosecution.

A New Birth in Gas Polity.

The Presidential Address gave the keynote to all that followed during the two days' sittings; and the essence of the deliverance found its way into the speeches that were heard at the lunches given by the Manchester Corporation Gas Committee and the Salford Corporation Gas Committee, as well as at the Association's own banquet. The President showed in his address that, though he had lived and worked fairly deep down in the past of the gas industry, the spirit that has possessed him has been ever in line with contemporary needs. That spirit is ever buoyant within him to-day. It was traced in several places in the address; and especially when he challenged any negation of his claim in the words: "This is the very latest of gas associations; and I decline to consider myself out of place at its head." Denial of the statement was not forthcoming; there was a strong affirmation from the densely packed audience. Our natural forces are unabated—they are, in fact, stronger than ever; and can be rendered stronger still by all joining the ranks of the new organization. The President commands us to look ahead in this matter of commercial interests, and to do so unitedly. The industry, he holds, has already suffered from its divisions. But "the dawn of a fuller conviction of the unity of interest" is here; and the members representative of all interests in that industry "are the heralds of a new birth in gas polity." The doctrine of the "mutuality of interest" opens up new vistas. There is a great work for the gas industry to do, in which work the interests of the community and those of the suppliers of gas show mutuality. We stand for unity in rendering service, said the President, and particularly to the poor. The power of the gas industry in ameliorating social conditions is immense; and the vesting of parliamentary rights in gas undertakings—municipal and company—imposes an obligation to render this public duty. We can expand and widen our services to the community; and the British Commercial Gas Association can do a great part in this work, by its educational methods. All such expansion means a gain in strength to the gas industry. Thoughts of this kind sparkled throughout the address. There was no sentimentality about it all. There was the robust faith; the counsel of mature experience; and the policy of a broader service. There is much work for the Association to do; and not the least part of this work the President shows is the uprooting of error, and the planting of truth in its place, so far as the error affects the enterprise and the legitimate rights of the industry.

The address was listened to with rapt attention; and, as we say, it had its influence right along the line of the proceedings. When the President came to reply to the vote of thanks to him, he expressed what many others felt. He was impressed by the gathering; and he was not then familiarized with the new presentment before him of a vigorous united action and co-operation on the part of the various component interests. "I have never known anything like it," he said. Nor anyone else in the gas industry.

Fresh Recruits.

The report of the General Committee was published in our columns last week. It was adopted without comment; there being nothing from which to dissent, but everything to endorse. Even after the report was printed, the roll of the Association was increased (before the meeting) by four more gas undertakings; making the number 256—Ossett, Blyth, Plymouth, and Chesham being the new comers. The conference in Manchester is going to bring in other new adherents. There were several undertakings represented there who are not yet subscribers—the come-and-see-for-yourself policy having been applied to the conference by the organizers. And their acuity in doing this has already been rewarded with ripe and refreshing fruit.

Good Aims and Good Claims.

We are not proposing to review the papers or the discussions in the ordinary way here, but intend only to call attention to a few points to indicate trend more than substance. The first paper was taken on Tuesday afternoon; and the attendance was practically as large as during the morning sitting. The communication was by Mr. H. James Yates, on the "Aims and Claims of the British Commercial Gas Association." Actually, the paper itself was not much discussed; but it gave scope for the contribution of many matters hinging on it. Why the paper was not largely discussed was that those present were mostly converted to the policy on which rest the aims and claims of the Association. To these the paper is belated; but it is for the consumption and digestion of those still outside the organization. And the hope is that after the paper has been read by those still on the wrong side of the fence, there will be speedy communication with the offices of the organization in regard to enrolment. The positive aspect of the Association's work has been seen——and has been felt by unscrupulous rivals. The Association is not out to attack competitors, but part of its work is to meet and to repel attacks, and to educate the public up to the truth of matters of importance to them, so that knowledge may be the antidote to the poison of misrepresentation. The Association is the repository of facts and ability; and the stock of these essentials in competitive commercialism is at the disposal of subscribing undertakings when required. The paper contained a sketch of the Association's plan of campaign. Mr. Yates also points to the potential capacity of the Association to extend its work into new channels. The claims of the Association are undoubted, both on the gas supplier and the manufacturers of gas making and gas using apparatus and appliances. Nowhere does success follow one part of the gas industry to the exclusion of the others. If one part makes progress, in that progress is reflected that of the other parts. Therefore the work of the Association appeals to all. The work, too, lies in a different channel from local operation and endeavour. It must be supplementary to that work, and does not extinguish the necessity for it. The work of the Association rounds-off all local enterprise in this connection. In our commercial methods, there must be no blank spaces. They should be perfect as possible; and without the Commercial Gas Association they would to-day be deficient of an important factor.

There was a long discussion—not particularly directed to the paper, but withal interesting and instructive. Among the grain that fell, there was the interesting statement of Mr. Alex. Wilson that, since the beginning of April, the Gas Department of Glasgow has sent out nearly 50,000 cooking appliances; and something like 150 heating appliances are now going out every day. Glasgow is a model

of local enterprise in stimulating business, but Glasgow also believes in the cumulative effects on industry of co-operation. Mr. S. Meunier fails to grasp the lengths to which an Association of this kind may go. Apothegm flowed freely; and the recognition of the "dawn" of the new industrial spirit was found plentifully illustrated in the remarks of Mr. Fred J. West, Mr. W. D. Helps, Mr. H. M. Thornton, and Mrs. M. A. Cloudesley Brereton (who asked for living suggestions from, and the contribution of material by, members to help her in her work, while not hesitating at the same time to make good use of the staff of the Association). To get to the learned societies and bring before them the truths of modern science in relation to gas use, about which some of them appear to be very defficient, is a strong desire of Mr. A. W. Oke, who has suffered from stagnant air in electrically lighted places. That the possibilities of gas are not exhausted is the belief of the ubiquitous and cosmopolitan Mr. Leon Gaster. Mr. Samuel Tagg wants the Association to have at hand some trained men, whose services the provincial gas undertakings can command when necessary. There is agreement with Mr. H. Kendrick, that there is work to be done in educating our sanitary and local authorities regarding the science of the uses of gas. Our friend called attention to the issue of a book for electricity salesmen, and pointed out that a similar one was required for the gas industry. We may introduce to his notice the newly issued "Competition Points for Gas Salesmen." There are the unseen influences too of the work of the Association; and this was a point upon which Mr. Thomas Glover had something to say. Through the agency and the persistent agency of the Association, new knowledge is being propagated. The same speaker wants the Association to keep a register of ladies, specialized in the uses of gas, who can undertake temporary or periodical inspection. Being connected with an undertaking which is not a subscriber to the Association, Mr. Harold E. Bloor could speak feelingly on the subject of while managers approve and recommend, committees and boards of directors sometimes disapprove and negative recommendation. His remarks contained much candid expression of view; and we hope it will do some good. Speaking of the cost to an undertaking of subscribing, Mr. John Young (who is always worth hearing, because there is generally point in his utterances) shows that it is a ridiculous average amount that the Association asks for by way of subscription. If the average consumption of consumers is 33,000 cubic feet of gas a year, the subscription only amounts to 1d. per annum per consumer. The value of advertising was illustrated by Mr. H. Townsend showing the difference in the sales per consumer of sleepy-headed administrations who will not advertise and cultivate business, and of those who push business by the best of commercial agency. Mr. S. R. Barrett, Mr. Douglas Helps, Mr. J. H. Hill, Mr. W. M. Valon, Mr. P. E. Culling, and the President also contributed to the discussion.

Lewes on Hygienic Aspects.

In the evening there was the first annual dinner, graced by several guests—civic, educational, professional, and otherwise. Mrs. Cloudesley Brereton was also simultaneously entertaining at dinner the ladies of some of the guests of the Association, and later she held a reception, which was attended by a large number of ladies interested as doctors, health workers, educationists, and so forth. In every way these events were highly successful. The guests later on trooped into the theatre of the hotel; and ladies and gentlemen distinguished in municipal and professional life listened to Professor Lewes while he discoursed on the "Hygienic Aspects of Gas for Heating and Lighting in Home, School, and Workshop." We fancy we recognized one or two electrical engineers in the audience; and they were no doubt somewhat ashamed of the foolish position into which ignorance has landed some electrical men on the subject of carbon dioxide, on the assumed power of gas to draw from the air its oxygen, and leave the diluting constituents behind, or else create a vacuum in the rooms in which this miraculous process goes on. When the position comes to be scientifically examined, gas takes the lead among illuminants for maintaining a hygienic condition within the walls of dwelling-houses and other places. This is said on the attestation of scientific observers and investigators, and not on those of the factory inspector bound up by a *pseudo*-rule of parliamentary manufacture. Professor Lewes won his audience. The lecture was highly successful; and all agreed that good service had been done by its delivery. All that the gas industry asks for is that old-established misconception shall not be circulated as truth by men who profess to have some acquaintance with the science of these things, but whose acquaintance ends with the profession.

Showrooms.

Next morning we were listening to Mr. George Clarry on the subject of showrooms. There are showrooms and showrooms. Showrooms have an educational mission to perform; but all showrooms are not possessed of those virtues and features that should make them the business propagators that they are intended to be. Mr. Clarry tells us what should constitute a showroom. How it should be a living demonstrator of facts and capacities, and how it should be manned by salesmen who know what they are talking about. This is most important. The technical side of the education of some showroom attendants has been lamentably neglected; and they have little knowledge that will keep their feet from stumbling when confronted by a prospective customer who is anxious to learn something as to the relative merits of (say) a certain gas appliance and its electric cognate. If anyone has any doubt as to what is the science and art governing this matter of the showroom, he has only to read this paper by Mr. Clarry. He need not adopt an electric-fan for ventilation; but he may take it Mr. Clarry is not a bad guide in the matter of the showroom generally, and he has achieved excellent results from his practice. Mr. W. N. Westlake bore testimony to the good work of the showroom; and Mr. John West was reminiscent, and gave an account of pioneer work along the same lines (though not so many lines) sixty years ago, which shows that some undertakings have been a long while getting educated in how to do these things. Mr. T. Canning realizes the importance of the showroom; he also realizes that a combination of forces promotes the consumption of gas. He rather fancies that the fittings makers do not produce such beautiful fittings for gas as for electricity. The visit of the qualified inspector is found by Mr. C. Stafford Ellery to be good. Mrs. Cloudesley Brereton touched on the point of fittings. She finds that there are just as beautiful fittings for gas as for electricity; but at certain large emporiums in the Metropolis when she has asked for gas-fittings she has been shown antiquities, and when for electric light fittings she has been shown something pretty. The secret of this probably is the excellent showrooms of the Gas Companies in London, where people usually go for gas-fittings, and not to the Stores. However, the makers of gas-fittings might do a little missionary work among the Stores. Mr. W. D. Helps seemed to think that too much was being made of automatic lighting and extinguishing in connection with gas. Gaslight, in his opinion, is so cheap, and a district looks so well when the houses are lighted up, that he hopes there will not be too great a pressing of these things. The President and others are not with him; and Mr. A. E. Broadberry showed the existence of perfectly reliable lighters and extinguishers from which defects revealed by experience have been eliminated. Mr. Clarry was drawn on the use of an electric-fan in a gas showroom; but where a showroom demonstrates how to generate electricity by a gas-engine, he thinks he may as well have something to operate by means of the energy.

Coke Sales.

In the succeeding paper, Mr. J. Ferguson Bell put forward the case for developing coke sales. All attention must not, of course, be devoted to gas. The more gas sold, the more coke produced. There is no difficulty at the moment in disposing of coke at good prices. But Mr. Bell would have all gas undertakings develop local coke sales, and give attention to the quality of their coke, in order that demand may be kept up at such a level that prices will also be maintained. When one comes to examine into the question in relation to the use of solid fuel in any area, there is no doubt that, if coke were popular, the demand for it would exceed the production in that area. "From this it would seem that every gas undertaking, irrespective of its geographical position, should be able to dispose of the whole of its make of coke within its own area of supply." The suction-gas plant should be a good customer.

There were several contributors to the discussion—Mr. Thomas Berridge was one. Mr. R. S. Hilton succeeded—giving the interesting information that, in about a fortnight's time, they hoped to be supplying metallurgical coke from coke-ovens at the Birmingham Gas-Works. Mr. E. Allen

and Mr. H. Kendrick were contributors to the discussion; the latter advocating the proper preparation of coke for sale, and having it in a dry condition. From Mr. Watson, we heard of the question of dumping coke in different districts by gas undertakings; but the cultivation of the coke business by producing better quality coke was also a point in his remarks, as well as in those of Mr. John West. A prospective customer for the metallurgical coke of the Birmingham Gas Department is Mr. Yates.

Among the Doctors.

Mr. H. H. Creasey read a paper on the campaign that he, under the instructions of Mr. Goodenough, has been carrying on among the doctors in the Gaslight and Coke Company's area. The breezy style of the author soon put him on the best of terms with his audience. The doctor is a power of great magnitude; and his interest, good opinion, and example are worth something in the interests of gas heating. One wants specially trained men to meet the doctor and the architect; one wants men who are diplomatic; and one wants to allow the men some latitude in fixing a trial gas-fire free, in order to gain the influence of the doctor and the architect. How Mr. Creasey sets to work, and the success he has achieved, are found in his paper; and it is a remarkable record of success—not beyond the deserts of gas heating, but in breaking-down the barrier of prejudice and objection, and setting-up warm and influential advocacy. Consider these figures: Out of 4012 medical men in the district of the Company, 2484 are now users of gas-fires. We need not go farther. Mr. Creasey is to be complimented on his success.

Mr. Douglas Helps, Mr. A. E. Broadberry, Mr. F. A. Pye, and Mr. Goodenough contributed to the discussion. One point that is of importance—and it was impressed by the last speaker—is that one must see that every gas-fire that is installed is properly fixed. That is the secret of success in giving satisfaction, provided the fire itself is correct in the principles of its construction.

At the Close.

The formal part of the conference came to an end before lunch time when the members were to be the guests of the Salford Gas Committee. Before leaving the Manchester Town Hall, however, it was decided that the meeting next year should be held in London—naturally in view of the Exhibition. Many were the acknowledgments of the indebtedness of the members to hosts and to the officers (honorary and paid) of the Association. Among some of the last words that were heard on the occasion from the President were these: "The success of the meetings has astonished me more than anything I can think of in my professional career."

Science of Business Building.

We journeyed to Salford to enjoy the hospitality of the Salford Corporation Gas Committee, as reported elsewhere; and later in the afternoon heard an address by Mr. A. F. Sheldon on "The Science of Business Building." Mr. Sheldon is a magnetic personality, and he has a style of delivery, and a command of philosophical argument, that make one listen to him without any feeling of weariness. The making of a business man—the development of the business faculties that are in him—is a science and an art. Mr. Sheldon tells us of all these things.

Social Events.

We have not spoken here of the social events. They are dealt with in other columns. But let it just be said, in conclusion, that the hospitality the visitors enjoyed was bountiful, and the charming friendship and kindness that accompanied it all will remain in the forefront of the memories of this, the first annual, meeting of the British Commercial Gas Association.

GENERAL REPORT.

The proceedings commenced with the reception by the Lord Mayor of Manchester (the Rt. Hon. S. W. Royse, J.P.), and the Mayor of Salford (Alderman Linsley), both of whom wore their chains of office.

The Lord Mayor of Manchester, who was accompanied by the President of the Association (Corbet Woodall, Esq., J.P., D.Sc.), expressed his great pleasure at seeing so large a gathering of those interested in the commercial progress of the gas industry; and he was glad that the Association had honoured Manchester by selecting the city for their first meeting.

The Mayor of Salford also expressed his pleasure at being present at the opening of the first conference of the Association, and said that he should hope to have an opportunity during the proceedings of seeing the members again.

THE BUSINESS MEETING.

This was held in the Lord Mayor's Parlour at the Town Hall—Corbet Woodall, Esq., J.P., D.Sc. (the President) in the chair.

Addresses of Welcome.

Councillor W. Kay, J.P. (the Chairman of the Gas Committee of the Manchester Corporation), in offering a welcome to the Association, said: I feel that it is a very great privilege to have the opportunity of addressing to you a few words of welcome to the city, in the affairs of which I have the honour to take some part. I am not egotistical when I say that no better place in this kingdom of ours than Manchester could have been found for the first meeting of the Association. [Hear, hear.] I say this, firstly, because we are practically the "hub of the universe." [Laughter.] This can be taken for granted, because within a few miles of where we are sitting is the largest mass of population in the kingdom. Therefore, no better spot could have been found for our first meeting. I have been asked, on many occasions latterly, why so much publicity has been given to the British Commercial Gas Association in Manchester. I have invariably replied that there are many reasons, but the principal one, in my opinion, is that we in Manchester are especially greatly interested, because we are in a smoky city; and I look to the propaganda work of the Association, and the admirable work that has been so well commenced, and I hope will be splendidly finished, to bring about a greater use of gaseous fuel in the future. There is no doubt that in the past the gas industry has practically stood still; and the competition which it has had to face will, I think, be the means of bringing it to the top in its own particular line. We are business men, and want to get on; and as there is a lot of work before us, I do not propose to say more at this moment than to express to you, on behalf of the Manchester Gas Committee and the citizens generally, a very hearty welcome to the City of Manchester.

Alderman F. S. Phillips, J.P. (Salford): Mr. President and Gentlemen,—I also esteem it a very great privilege to have the opportunity of saying, on an occasion like this, and in face of so magnificent a meeting as we have here today, on the part of the neighbouring borough of Salford, that we join most heartily in offering to you a welcome to this city. I am quite sure that the result of your deliberations at this conference will be that the claims of gas, not merely as a trade agent, will receive recognition. We are not here merely as traders seeking for profit. We are here with a far higher and a far nobler purpose, because, as a matter of fact, we are missionaries who are going to do the very utmost that we can, and with some measure of success, I have no doubt whatever, to make the lives of the people brighter by improving their homes, and by removing many of the clouds that darken our atmosphere. I was struck on hearing a most excellent paper read at a meeting at Birmingham, in which it was stated that the result of the dense clouds of smoke which are poured out into the atmosphere of that city and similar places is such that we only get one-half of the sunshine that Nature would give us if only we were ready to receive it. If this Association can do something to bring back some of the sunshine that we have lost, it will have achieved a great thing. I hope, with my colleagues, to have opportunity of welcoming you on your visit to Salford. I can assure you that our welcome will be a sincere and hearty one, and that we shall do all we can to make your visit not only profitable, but really pleasant and agreeable.

The President: I think, gentlemen, that we have all been, not only gratified by the kind addresses of welcome that we have heard from the Chairmen of the Gas Committees of Manchester and Salford, but that we have been very much touched by the whole-hearted way in which the Corporations of these two great cities have combined to make the meeting a success. We can all join with Alderman Phillips in the feeling that, if we were here simply as a Society aiming at increasing the profits of our

undertakings, we should not have had the welcome which has been accorded to us. There is in this united effort, not simply of the producers of gas, but also of the manufacturers and others who are interested in our industry, the purpose of extending, not simply the profits, but also the application and the usefulness of our industry; and it is in this that we find the explanation of the welcome we have received. Councillor Kay has referred to the influence that the extension of the use of gas has upon the atmosphere of cities such as Manchester. May I be permitted to utter just a few words of personal reminiscence? I am delighted to be here presiding over this meeting to-day for its own sake; but when I remember that it was my good fortune, on the invitation of the Corporation of Manchester, to introduce public hydraulic power into this city, whereby I suppose some two hundred chimneys ceased to belch forth smoke, and the amenities of the city were thereby improved, I feel that I have a double satisfaction in presiding over this meeting to-day. I beg to propose that our very best thanks be given to Councillor Kay and to Alderman Phillips for the kind words they have addressed to us at the opening of our proceedings.

Mr. Wade Deacon (Chairman of the Liverpool United Gas Company): My Lord Mayor and gentlemen, it is hardly necessary for anyone to second such a vote as this; but coming from the sister city of Liverpool, I have much pleasure in seconding the vote of thanks to the gentlemen from Manchester and Salford, for their hearty welcome.

The resolution was passed with acclamation.

Presentation to the Past-President.

The President: My Lord Mayor and Gentlemen, among the many interesting and gratifying incidents of this remarkable gathering, one of my most pleasant duties is the presentation to Mr. R. G. Shadbolt, the Past-President of the Institution of Gas Engineers, of a resolution passed by the General Committee of the British Commercial Gas Association on his retirement from office. In the course of Mr. Shadbolt's year of office, he had many opportunities of serving the industry; and on all his undertakings he brought to bear an amount of resource and whole-hearted zeal that could not have been improved. Among the opportunities outside the work of the President of the Institution of Gas Engineers was the formation of this Association; and I believe I am right in saying that no one gave to it more intelligent work and application and self-denial than did Mr. Shadbolt. [Applause.] The feeling of the Committee is embodied in the resolution which has been engrossed and framed; and I am proud to be permitted to be the means of making the presentation to our friend Mr. Shadbolt on behalf of the Association.

Mr. F. W. Goodenough (the Deputy-Chairman of the General Committee): The resolution that was passed by the General Committee of the British Commercial Gas Association at Whitehall on June 13, 1912, is as follows:—

> That the best thanks of the Committee be accorded to Mr. R. G. Shadbolt for his services to the Association during his term of office as President; and that their warm appreciation of the energy, tact, and courtesy with which he has performed the duties of that office be recorded on the minutes.

If I may add a word, I should like to bear my testimony to the very valuable help that the Executive and the General Committees received from Mr. Shadbolt in the carrying out of their work. [Applause.]

The President then presented Mr. Shadbolt with an illuminated copy of the resolution.

Mr. R. G. Shadbolt: Mr. President, my Lord Mayor, and gentlemen, this is a particularly pleasing and proud moment for me, although, at the same time, to speak quite honestly, I cannot lay claim to all the credit which you have been good enough to give me. Seated by my side is my friend Mr. Wilson, who preceded me in the chair of the Institution of Gas Engineers; and I well remember the strenuous spade-work that was done during his year of office. It has fallen somehow or other to my lot to continue the work so well commenced by Mr. Wilson, and, through force of circumstances, to find myself in the position of being the first President of the Association. It was from force of circumstances simply; and I merely did my best to apply the old biblical adage which exhorts us to do with our might that which our hands find to do. Although this movement appears to have grown very rapidly since the Association was formed, those of us who have been engaged in it from its inception know that it has taken some time to develop. But can there be anything more gratifying than to know that it has taken root so deeply and quickly, and is giving evidence of such a sturdy growth as is exemplified by this Association? I have to thank you, Mr. President and gentlemen all, and particularly Mr. Goodenough, who I believe was the instigator of this recognition of my small services, for the way you have expressed it. If anything were needed to make one think that he had done something worth living for, it would certainly be shown by the gathering assembled to day; and nothing could have been in better taste than the presentation which you have now made to me. [Applause.]

President's Address.

The President then delivered his Inaugural Address, which was given in the "Journal" last week (p. 89).

Colonel H. Oakden Fisher (Chairman of the Cardiff Gas Company): My Lord Mayor and gentlemen, it is my privilege to ask you to join with me in recording a hearty vote of thanks to the President for his very excellent address. It has brought home prominently to us the great advantages of this Association; and I hope we shall use our best endeavours to induce those unfortunate gas companies who are still outside to join it. I do not think any more appropriate appointment for the President could have been made than our worthy friend Mr. Woodall. He is also this year the President of the Institution of Gas Engineers, and I am sure we shall feel that in Mr. Woodall we have a most excellent President of this Association. Mr. Woodall has been the backbone of the gas industry for I am afraid to say how long, and I consider him an excellent "boosting" plant. I will not detain you now with any long speech, but will, in conclusion, ask you to join me in congratulating Mr. Woodall on the honour which has been conferred upon him by the Leeds University. The President, in his address, quoted the old saying: "Make money—honestly, if possible." But I am afraid the public are now so educated that unless we sell them an honest article at a moderate price we cannot expect custom. All that has been done by the commercial side of the gas industry has been done to improve the situation. I believe the public are getting a better article now than they did some years ago, and at a more reasonable price. I now ask you to join with me in according to the President a very hearty vote of thanks for his excellent address.

Alderman Jessop (Huddersfield): It gives me very much pleasure to second the vote of thanks so ably proposed by my friend Colonel Fisher. I think we shall agree that the Executive Committee made a very wise selection for their first President of this Association, and our thanks are due to them for it. We have all been delighted with the very able address given to this new Association by our first President; and I feel almost inclined to say, as an old father of the Council, that I am glad here to be able to take part in blessing the new baby. I trust that the address will result in very great good to the future of the gas industry; and I hope that, even in the little county of Yorkshire, not only the Corporations who have the management of their Gas Departments, but all the private companies, will work with Lancashire in trying to make the Association a great success. Gentlemen, I do not need to detain you longer. I entirely agree with Colonel Fisher, and have much pleasure in seconding the vote of thanks to our President for his address.

The motion was put and carried by acclamation.

The President: Colonel Fisher, Alderman Jessop, and gentlemen, I thank you very warmly for the words in which this resolution has been proposed, and the manner in which it has been received. I confess to having felt very grave doubt as to the propriety of my accepting the invitation to preside over this Association; but the kindness of my friends was such that my own inclination gave way. I cannot tell you how impressed I am by this gathering, and by what it represents. With regard to the manner in which this idea of united action on the part of the various industries which go to make up the gas industry as a whole has "caught on," I confess I am not familiarized with it yet. I have known nothing like it; and I think that this gathering must be an augury of very great success in the immediate future. Again I thank you for your kindness in receiving what I have been able to say, and I hope that the rest of our meeting may be characterized by the same heartiness that has marked its opening. [Applause.]

Apologies for Absence.

Mr. GOODENOUGH then read the following letter from Sir Hallewell Rogers, the Chairman of the Gas Committee of the Birmingham Corporation, addressed to Mr. Woodall:—

> Sir,—It is a real disappointment to me that I am not able to be at the first conference of the British Commercial Gas Association, and especially not to be able to propose the toast of "The Association" and yourself at the first annual dinner, for I felt very honoured by being asked to do so. I quite recognize that you are celebrating the birth of a new era in the life of the gas industry, which during the last five or six years has been slowly awakening from its previous somnolent state, and, pricked into activity by the efforts of its young competitor, is increasingly aware of its own tremendous possibilities. It is a strange thing that, notwithstanding that gas is now a hundred years old, it appears to be only in its infancy. Its uses, due to greater scientific knowledge in the construction of apparatus, are becoming more and more varied every day; and some of us are realizing for the first time the tremendous value of the commodity we sell. We are, however, not now alone in the field, and have to meet the challenges of a young and very active rival. It is very necessary, therefore, that a combined effort of this kind should be made to remove prejudices, counteract misrepresentation, and let the nation know what the possibilities of gas are. Had I been present, I meant to have emphasized the great value it is to the Association to have you as its first President. Your experience and great knowledge in all gas matters will be of inestimable help. Will you please express to the members of the British Commercial Gas Association my great regret at not being present?

Mr. GOODENOUGH announced that he had also received a letter from Bailie Paxton, of Glasgow, regretting his inability to attend the Conference. Sir Joseph Bellamy had telegraphed the gratifying news that the Company of which he is the Chairman—the Plymouth and Stonehouse Gas Company—would join the Association. This would mean a contribution, he said, of well over £100 a year to the funds.

Annual Report and Accounts.

Mr. GOODENOUGH next read the report of the General Committee, which was given last week (p. 91).

The PRESIDENT: I will not ask Mr. Goodenough to read the accounts of the Association, as there is a summary of them in the report. May I ask whether you will accept the proposed alterations and additions to the rules, which are purely formal, without their being read? ["Agreed."]

Mr. ALEXANDER WILSON (Glasgow): Mr. President, before moving the resolution that I now rise to propose, perhaps I may be allowed to say that my colleague is sorry he is not able to be present, but he wishes me to assure you that he is interested in the Association work, and will do all he can to forward it. The resolution is: "That the report of the General Committee, together with the suggested alterations in the rules and the statement of accounts (subject to audit) appended thereto, be approved and adopted." Having done a certain amount of the "spade work" in the formation of the Association, as Mr. Shadbolt very kindly said, you may take it that I am deeply interested in it. I have talked about the Commercial Gas Association's business in season and out of season; and I think, if we are to succeed, this is what everyone of us will have to do for a good long time to come. There is an immense amount of work lying to our hands. Until one begins to go into the matter, no one has any idea how far we can go in the way of pushing gas. I think we are only on the brink of a revolution in supplying the needs of the community with gaseous fuel. The President remarked that what Lancashire says to-day, all England will say to-morrow. I suppose he left Scotland out of account because we have got past the stage of saying things; we are already in the doing stage. In Glasgow we have been talking, advertising, and scattering writing for several years on the smoke abatement question; and I am glad to say it is bearing fruit far beyond our expectations. The work we have been doing, aided in great measure by the assistance we have received from this Association in the shape of literature which we could never have prepared for ourselves in anything like the way it has been done for us, has been simply astounding. We have a Smoke Abatement Exhibition on at the present time; and at the exhibition we are giving away wholesale the literature prepared by the Association. I do not think I could do wrong if I were to give you some of the figures with regard to the work we have done. We have by now sent out well on to 50,000 cooking appliances; and at the present time we are sending out every day anything from 150 to 200 cooking appliances, fires, radiators, and so on. This is what we may all look forward to if the Association's work is carried out in the right spirit, and everyone takes up his share of the work and the responsibility. I do not think any of us need be afraid of the success of our Association. In confirmation of this, we have only to look round at the present meeting. It is said that "nothing succeeds like success;" and I am sure the work will go on in such a way that the results, as I said before, will be far beyond what any of us realize at the present time. I will not say any more just now, as perhaps I may have an opportunity later of putting other figures before you; but I will meantime content myself with moving the resolution for the adoption of the report and accounts.

Mr. S. MEUNIER (Stockport): Mr. President and gentlemen, may I be allowed, in the first place, to thank the Executive for their kindness in calling upon me to second this motion, and, in the second place, to congratulate the Association on the venue chosen for the first meeting? It was only right that it should have been decided to hold it in Manchester, because if you trace the history of the movement back to its fundamental principles you will find that the work which has been undertaken now by the British Commercial Gas Association originated in the Manchester district among a few of the engineers and managers in the district. At that particular time, when the assistance of the Manchester District Institution of Gas Engineers was asked for, the question was raised: "How far do you expect to go?" Mr. Wilson has very truly said that it is impossible to understand, or even to guess at, how far the Association is likely to go. I do not think it is possible for any of us to realize exactly where the work inaugurated at this first meeting will finish, or what the scope of it will be. The possibilities are world-wide. For my part, I hope the work will never cease till we practically have the whole of the gas industry, both at home and abroad, in absolute unity for the benefit of the industry which we are all proud to represent. But, as our President has very aptly said, you cannot make bricks without straw; and money, after all, is an absolute requirement. We have done wonderfully well. In fact, as one who has had a great ambition for the success of the movement, I am absolutely astounded at the immense amount of good work that has been carried out with so small a sum of money as has so far been received; and I hope that this first meeting will result in practically all gas undertakings, whether private or municipal, joining and putting their little share into it. If every undertaking pays its share, all will benefit equally. It is not quite the right thing to share in the benefits and at the same time do nothing towards "paying the piper."

The PRESIDENT: Perhaps I may inform Mr. Wilson that there was no suggestion of leaving out Scotland. I was only quoting a remark made on a political matter, which was limited to England at that time.

Mr. WADE DEACON: There is only one point to which I wish to refer, and that is with regard to the rules. No notice of these alterations has been sent to the subscribers. You, Sir, tell us that they are formal; and, of course, I take your word for it. But I would venture to suggest that, in future, whenever any alteration is made in the rules, notice should be sent round long before the meeting to the various subscribing corporations and companies.

Mr. H. KENDRICK (Stretford): There is one question I should like to ask, and it is with regard to the alteration of Rule 2. What bearing will this have on the voting power of the Vice-Presidents in the future?

The PRESIDENT: I may say that I entirely sympathize with the observations made by the Chairman of the Liverpool Gas Company that, as a rule, any alteration of the rules should be circulated before being put to the vote. But this meeting has been got up under considerable pressure; and while the alterations were circulated in the Association's "Bulletin," it was not possible to get out the report itself so early as was desirable. With regard to Mr. Kendrick's question as to the Vice-Presidents, I am not clear about the situation; but I can say that the Vice-Presidents referred to will not vote unless they are elected on the General Committee.

Mr. KENDRICK: Under the existing rule, each district is entitled to have two Vice-Presidents. By the alteration of the rule, this right will be taken away; and it will be possible to nominate the whole of the Vice-Presidents from one particular district.

Mr. GOODENOUGH: I would here point out that the Vice-Presidents have no voting power whatever except the three

who are elected on the General Committee by the whole body of Vice-Presidents. The object of the alteration is to remove a limit which was found to prevent us giving the honour of being Vice-President to several gentlemen whom the Association would like to honour. I think the members may take it that the General Committee would never act so contrary to the interests of all concerned as to swamp the vice-presidency with gentlemen from one district only.

Mr. R. G. SHADBOLT: Is it not the fact that at the present time each area has its Vice-Presidents on the list, and that they remain there for all time? They are not there for a term, but each area now has due representation, and will continue to have it so long as the Association lasts.

The PRESIDENT: That is so.

The motion was then put and carried unanimously; and the proceedings were adjourned for luncheon.

Papers and Discussions.

At the afternoon sitting, and that of the next morning, the greater part of the time was occupied with reading and discussing the following papers, which, with a report of the discussions to which they gave rise, will be found in another part of the "JOURNAL" (pp. 184-208):

"The Aims and Claims of the B.C.G.A.," by Mr. H. JAMES YATES, F.C.S., M.I.Mech.E.

"Show-Rooms in Relation to Gas Supply," by Mr. G. CLARRY, F.C.I.S., of Cardiff.

"The Development of Coke Sales," by Mr. J. FERGUSON BELL, M.Inst.C.E., of Derby.

"A Campaign among the Doctors," by Mr. H. H. CREASEY, of London.

The Hygienic Aspect of Gas.

After the first annual dinner on Tuesday evening [reported elsewhere] Professor VIVIAN B. LEWES delivered a lecture in the Theatre of the hotel on the "Hygienic Aspect of Gas for Lighting and Heating." The President was in the chair; and he was accompanied by a large number of the civic dignitaries who had been the guests of the Association, and of their ladies who had been the guests of the editor of the Association "Bulletin" (Mrs. M. A. Cloudesley Brereton). The audience comprised several hundreds, and included doctors (lady doctors as well), health visitors, architects, and many concerned in educational and other professional work. Professor Lewes was quite in his old form; and his lecture was illustrated by good experiments. These, with many a witticism, gave just that touch to the lecture that made it anything but an inappropriate supplement to the festivities of the evening. The lecture, which succeeded an introduction in happily turned phrase by the President, will be found on pp. 208-11.

At the close of the lecture,

Bailie JOHN A. LINDSAY (Edinburgh) remarked: We have listened with the greatest of interest to the excellent lecture delivered by Professor Lewes. I feel that the rapt attention with which one and all have followed him shows how the lecture has been appreciated. The Professor has given us to-night an amount of information which will be useful to every one of us in the future. After what we have heard, we shall have a very kindly feeling towards the black patch on our ceilings. As the Convener of a Public Health Committee, I am glad we have had such a master mind to give us information on this subject. It is very interesting and most encouraging that a gentleman of Professor Lewes's standing is in the position to say that gas burning from everything does not produce the deleterious results as supposed by those who are interested in electricity. Instead of electricity being, as some thought, ahead of gas in the sanitary aspect, it is really gas that is ahead of electricity. I propose that we accord the Professor our very heartiest thanks, and at the same time congratulate the Executive Committee of the Association on having brought to their conference such a master mind.

Professor HAROLD B. DIXON, M.A., M.Sc.: I have pleasure in seconding the motion, because I am sure that everyone who has heard Professor Lewes to-night is better informed on this subject than before the lecture. I am myself a Professor at the Manchester University, dealing in a small way with the same article that some of those present manufacture on the big scale. Seriously, I think we are to be congratulated on the success of this opening meeting. We all in Manchester welcome the Association to our midst; and we congratulate ourselves and Professor Lewes upon this brilliant lecture. The Lord Mayor and the President have both said during the day that they would like to see gas sold as cheaply as possible. I think great things can be done for our communities and industries when we have gas at approximately cost price. And I think that as gas is made and supplied by the Corporation, we might even get it a little under cost price. [Laughter.] I see the motto of the Association is: "All for One, and One for All." With regard to the price at which gas should be sold, I think a little difference in the punctuation of the motto would meet the case: "All for One and One, for All." [Laughter.]

The vote was carried by applause.

Professor LEWES: I thank you most heartily for this vote; and I hope that every future meeting of the British Commercial Gas Association will be as successful as that of to-day has been.

Place of Next Meeting.

Mr. T. WADDOM (Newcastle-on-Tyne): I have a resolution which I ask leave to propose, not in set words; but the effect of it is that the next Conference meeting of the Association shall be held in London next year. I do not think such a proposition requires many words of mine in support. London seems to be the only fitting place for the meeting, as there will be a large National Exhibition held there next year, and it is exceedingly fitting that our Conference should be held during the time it is going on.

Mr. F. A. PYE (Chester): I have great pleasure in seconding Mr. Waddom's proposal. We have had an immensely successful meeting in Manchester, and without the aid of this district, our Association would hardly be in existence to-day. I think it is desirable that we should move about the country with our annual meetings so far as possible; but we cannot shut our eyes to the fact that it will never be convenient to the larger number for us to select towns which are more or less at the terminal of a railway system. We want to select areas which are as central as possible; and I am afraid it will be difficult to select suitable areas where we can expect a large number of representatives from different districts very much further North than this. As Mr. Waddom has said, it is expected to hold the Jubilee Exhibition in London next year, and there I have no doubt we shall experience how all the manifold difficulties of our large Exhibition at Earl's Court have been overcome, and how unnecessary it is to resort to an electric fan for the ventilation of an exhibition building.

The PRESIDENT: In the absence of any other alternative proposal, I will put the resolution to the meeting, and in doing so I would say how cordially I agree with it. I think that, in view of the exhibition which is just now much in our minds, and which we hope will be very well worth the while of all of you to come and see, London is essentially the place for our next meeting.

The proposal was then put to the meeting and carried unanimously.

Votes of Thanks.

Mr. J. T. JOLLIFFE (Ipswich): I propose that the thanks of this meeting be given to the Corporations of Manchester and Salford for the very kind way in which they have received us, and the opportunities they have given us for carrying on our business. Not only have they given us these opportunities, but the Lord Mayor of Manchester and his Worship the Mayor of Salford have also favoured us with their presence, which has added very much to our indebtedness. I have therefore much pleasure in proposing that our best thanks be given to these gentlemen for so kindly receiving us.

Mr. CHARLES HUSSEY, J.P. (Croydon): I am very pleased indeed to have the honour to second the proposition. I am delighted to have the opportunity of testifying to what Mr. Jolliffe said about the princely way in which we have been entertained by the representatives of the Corporations of Manchester and Salford. Not only have they entertained us in a princely way, but they have given us splendid opportunities in their excellent rooms for congregating and for expressing our opinions as we have been able to do on the various subjects brought before us. Not only are we thankful to them for this, but also are we specially thankful for the beautiful weather we have enjoyed.

The PRESIDENT: You have heard the resolution proposed and seconded. I am sure there can be but one voice and one feeling in the room with regard to it.

The resolution was carried with acclamation.

Councillor KAY, who on rising was received with loud

applause, said: In replying to the vote of thanks which has been proposed and carried, I am sure that I can say very little indeed except to remark that the Gas Committee, myself—in fact, the Corporation and the citizens of this great city—have been much honoured by your presence here. I can see nothing but good in the future to arise from your visit; and if the Committee have been able to afford you accommodation and somewhat of a welcome, it has given them much pleasure indeed. We shall all of us feel that our efforts have not been wasted, that the trouble that we have been put to has been amply repaid by your presence here, and by the splendid manner in which the business has been conducted right through. I can see nothing but a very happy augury for the future of the Association, not only in the improvement of the gas industry but the welfare of the people.

Alderman J. S. Phillips (Salford): I find myself in rather a peculiar position in replying to this very cordial and kindly resolution which you have passed, because our friends have not yet visited Salford. You are just perhaps a little bit anticipating the actual facts. However, I would join with you in all you have said about Manchester. I think the manner in which you have been entertained here, and the way our meeting has gone on, is a very happy augury for the future. Although we have not such a Town Hall as this to invite you to, you shall have the best that we can give you, with all the heartiness in the world.

Bailie Lindsay (Edinburgh): I wish to ask you to accord to our President a special vote of thanks for his services at the conference; and I am sure we shall all of us be glad to put on record our appreciation of them. I do not know why I have been singled out for such an honour, because your Chairman, as a gas engineer, is much better known to you than he is to me. I do know, however, that, as a commercial gentleman, whatever his standing may be as a gas engineer, his name will go down in history to posterity as a great administrator. I venture to think that the critical time that he came upon the scene when he was appointed Governor of the Gaslight and Coke Company was an exceedingly opportune one for that huge world-wide Company; and it was owing to his great wisdom, forethought, knowledge, and experience that the Company, instead of being in a critical position, is now, owing to his services, in a very substantial and realizable position, which is gratifying not only to the shareholders, but I should say is even more so to the consumers who are supplied by their mains. It has been acknowledged on all hands that our conference has been a great success by reason of the papers that have been discussed and the subjects that have been so well put before us. I have no doubt in my mind whatever that the great success of the gathering has been enhanced materially by the foresight and wisdom of your President, and that the spirit that has attended all our discussions has been in a great measure also attributable to the tact and the general genial nature, and yet the firmness and dignity, of Mr. Corbet Woodall. I should like to say that I am exceedingly pleased to have been here, and to have had this opportunity of expressing my satisfaction and my thanks to the Chairman of the Executive Committee for the kind invitation that was given to the Lord Provost, for whom I am acting as a substitute. I recognize that out of these meetings only good can result. I believe that in this Association we are on the stepping stone to things higher; and while I am here and wish the President to receive our thanks for his services, I also express the hope that your Association will reap the benefit that it deserves.

Mr. G. E. Hilton (Leicester): I take it as a great compliment that I should be called upon to second this important vote of thanks, especially considering that as yet Leicester has not joined the Association. However, I hope that this will be speedily remedied. I am sure that every member of the Association, and those who do not belong to it, are proud of the fact that Mr. Woodall is the President. He has obtained an honourable position in the profession through his own industry; and I have very great pleasure in seconding this vote of thanks.

The resolution was put and carried with acclamation.

The President: Bailie Lindsay, Alderman Hilton, ladies, and gentlemen, it is no affectation on my part when I say that I find it extremely difficult to reply to this vote. I have received during these past two days—and I am bound to say the experience is not new when I am meeting old friends and colleagues—a degree of kindness and thoughtful attention that I feel utterly unworthy of. The success of the meeting has astonished me more than anything in my professional experience. The period of incubation of this Society has been short; but we have evidently acting in association with us men of determination and discrimination, who have known what it was they were aiming at, and who have not spared themselves in the effort to accomplish the best. Among these men and that Executive I do not forget, and shall never forget, the lady who is one of them. I agree with Councillor Kay in the remarks that he made, that the promise of this meeting is one of great and brilliant success; but I would urge you to remember that at present we have only made a start on the work that we hope to do, and that this work will require not only the spirit that has animated this meeting, but an increased amount of energy and effort in order to carry it through to its proper fruition. I thank you very much indeed.

Mr. F. Barber (Harrogate): I rise with considerable diffidence to perform the duty which has been entrusted to me, which is, however, a very pleasing and a very important one. It is to move that the best thanks of this conference be given to the General Committee of the Association for the work done by them during their term of office. I think we must all realize that, after the permanent officials of an Association of this sort, the success must ultimately depend upon the men who represent us on the Committee. Dealing with the claims of the present Committee to our thanks, I think that they have been manifested at this conference very greatly indeed. I believe everyone present will join with me in expressing to them our gratitude for the excellent organization of this conference, and for the very capital arrangements made for the members attending it. Having said this, I think our next thoughts turn to the many evidences of the good work already done, during the very short period the Association has been in existence, by the Committee to whom I move this vote of thanks. I should like to bear my testimony to the worth of it from practical experience. I represent a Company embarrassed in many respects in the conduct of its operations by the fact that the Municipality have caused some difficulty in the conduct of our affairs. One of these difficulties is one which all gas managers would appreciate, and it is that they are endeavouring to take the whole of the public lighting away from us, and have intimated that it was no use our showing to them that we can do it much cheaper. I should like to refer to the kind way in which Mr. Goodenough received our General Manager and myself when we were in the throes of the difficulty I have referred to. I want to say how very much we appreciate not only the great courtesy of Mr. Goodenough, but the great aid he gave to us on that occasion. Since the Association has come into operation, we have derived considerable benefits from it. In conclusion, I can only say that I shall go away from this meeting impressed deeply with the good work already accomplished, and the work that is bound to be accomplished in the future, by the British Commercial Gas Association.

Mr. W. R. Herring (London): I have much pleasure in rising to second this resolution of thanks to the General Committee of the Association. In doing so, I think that I ought to associate myself with the words that have fallen from the proposer. I do not think any of us can say that we have heard one word of criticism or dissatisfaction at the manner in which the Association's affairs have been organized and conducted. While we know that a General Committee can do much, there is still an Executive Committee, who, no doubt, do more. The General Committee, I am quite sure, will heartily support the vote of thanks which has been so ably proposed.

The resolution was then put and carried unanimously.

Mr. Edward Allen (Liverpool): We all of us felt such a keen interest in this work, especially in its first year, that we almost consider this vote of thanks superfluous. We are, however, exceedingly grateful; and I would again emphasize what has been said before—how well the work of the Association has been carried on by Mr. Goodenough, the Chairman of the Executive Committee, and by Mrs. Brereton, who, I was almost going to say, is worth two good men. I thank you for the hearty way you have received this vote.

Mr. J. G. Newbigging (Manchester): The vote of thanks that I have to propose is one of the most important that you will have before you to-day; but as time is getting on, I will not detain you. I am sure we are very much indebted to the Executive Committee for the work they have done. Mr. Goodenough especially undertakes his

tasks with the utmost enthusiasm; and it is impossible to come in contact with him without being infused with his enthusiasm. The whole of the Executive Committee are progressive men in the industry; and I am sure we are much indebted to them for the work they have carried out during the past year. I have much pleasure in proposing that our best thanks be given to the Executive Committee for their services.

Mr. W. W. Woodward (Salford): I have much pleasure in seconding the resolution. The Executive Committee are the backbone of the Association, and nothing can be carried on without them. I think their names show that we have the very best men we possibly could have to form such a Committee; and if the Chairman of the Committee is not good enough to occupy the position, I do not know any man who is.

The resolution was put to the meeting and at once carried unanimously.

Mr. Goodenough, who on rising was received with loud and continued cheering, said: On behalf of the Executive Committee, I thank you very sincerely for the hearty vote of thanks you have passed. It is very gratifying to us that Mr. Newbigging and Mr. Woodward should have proposed and seconded the resolution, because we have given them no end of work during the last three years. It is very pleasing to find at the close of it that they have a good word to say for us. I much appreciate the kind words that have been said of me. Any small services I have rendered to the Association have been given from a keen sense of the value to the industry that the Association will be. But whatever I have done would have been impossible if I had not had the support at all times of the most able Committee that any chairman could ask to preside over. At the same time I wish to add my thanks to the Editor for the valuable help that the Executive Committee have received from her, not only with regard to the editorial work, but also with regard to organization and inspiration. Mrs. Brereton brings to her work an enthusiasm that is quite infectious, and a knowledge and experience that are wonderful. It is a very great pleasure indeed to me to move that the best thanks of the Association should be given to the Editor for her services to the Association.

The President: I am afraid lest the whole room shall be rising to second this resolution. Therefore I interpose and take upon myself the great pleasure of doing it. I put it that our best thanks be given to Mrs. Brereton for her indescribable services and help.

The resolution was carried with loud applause.

Mrs. Cloudesley Brereton: I think for the first time in my life at a public meeting I feel rather embarrassed. I have had such kindness showered on me in my work on the Executive Committee, together with the tremendous help of its Chairman (without which I could never have done my work), and the indescribable kindness of the President, that I feel that I hardly know how to thank you for your vote of thanks. I would like to couple with my thanks a word to the ladies who supported me last night. We had a very informal dinner, and I think we did a great deal of good in talking to the lady doctors and other public workers; but I could not have got on on that occasion with the official hand-shaking (in which both the Lady Mayoress and the Mayoress of Salford assisted me) if it had not been for the other ladies who helped me and who made the ball room a centre of propaganda which I am sure will not be lost, because many of them went away, if not quite converted in the biblical sense, yet almost converted, for we had the object-lesson of an artistic and perfect gas-fire, and many of them who thought it was impossible to have anything beautiful and artistic in a gas-fire would not have been converted if it had not been finished off by Professor Lewes. You have set me such a standard to act up to that it will be very difficult in future unless I have the help that I have had in the past.

Mr. Goodenough: There is one duty we must not omit, and that is to accord a vote of thanks to our energetic and untiring Secretary, to whom the thanks of the Executive are due.

The resolution was passed with loud applause.

Mr. W. M. Mason: I can only say that we have had a very strenuous time in London at the commencement of the organization; but it has been a good time, and we feel that we have been well repaid for what we have done. We hope, however, for great things in the future, and shall strive to attain them.

SOCIAL EVENTS.

The organizers of the Conference and the hosts of the delegates did not leave much time for the latter to cut to waste. Those who arrived early on Monday were booked for a meeting to consider the question of the 1913 exhibition in connection with the Jubilee of the Institution of Gas Engineers; and in the evening those who were of the Masonic fraternity were the guests of the "Northern Star" Lodge.

Masonic.

It was a graceful act on the part of the "Northern Star" Lodge that, on the occasion of the visit to Manchester of so many of the members of the "Evening Star" Lodge, that the hospitality of the latter to the former, on the occasions of the annual meetings of the Institution of Gas Engineers, should be reciprocated. Members of other lodges in attendance at the Conference were also invited. The banqueting hall of the Midland Hotel was the scene of the function, and it was a brilliant one. There were in all about 200 members of the craft present. The Worshipful Master, W.Bro. Fred J. West, occupied the chair, and was well supported by his Wardens, Bro. S. Meunier (S.W.) and Bro. T. W. Jordan (J.W.). On the invitation of the Lodge, a large number of Provincial brethren from all parts also attended. The ceremony of initiating Mr. Charles Potts, of Hyde, was effectively rendered; and the W.M. then offered a very hearty welcome to the members of the British Commercial Gas Association and the other visiting brethren. Subsequently, the members of the Lodge and their visitors dined together in the Midland Hotel, and a most enjoyable musical entertainment was provided.

LUNCHEON AT THE MANCHESTER TOWN HALL.

After the morning conference on Tuesday, the delegates were entertained at luncheon, in the grand hall of the municipal buildings, by the Chairman (Mr. Councillor W. Kay, J.P.) and the members of the Corporation Gas Committee. The Lord Mayor and the Mayor of Salford, Bishop Welldon, Sir Alfred Hopkinson, K.C., M.A., and several others engaged in the municipal work and life of the city and the neighbouring borough were present.

After the loyal toasts,

Mr. W. Kay said it was his pleasure to propose "Success to the British Commercial Gas Association." He remarked that after the morning's proceedings (he hoped that many of them had not missed the privilege of hearing the address of the President), little need be said to commend the toast to the acceptance of those present. He was satisfied that the Association was one that deserved their heartiest support, not only in the shape of a toast, but as an accepted and approved organization. The desirability, and absolutely the need, for such an Association had long been felt. He was delighted the first conference was being held in the city of Manchester; for he believed that no more appropriate place could have been found, because it was the centre of an enormous population, and, apart from everything else, there was a bigger field for development in Manchester and the neighbourhood than anywhere else in the United Kingdom. The more one studied the question of an amalgamation or combination of this description, the more it commended itself to all thoughtful persons, because collectively they could do more in such work as that in hand than they could individually. He hoped that this first conference would bring into the fold those undertakings that up to now were holding off in the hope of reaping the benefit without paying for it. This sort of thing was, and he was sorry to say it, somewhat a habit of not only many Englishmen, but other people. Those who reaped advantages ought also to pay for them, and pay for them to help forward the cause of the people in the matter of a cheap supply of gas. After all was said and done, it was not a question quite of dividend from the point of view of a gas undertaking; but it was the greater question of doing a great deal of good for a great many people who could not help themselves in a matter of this kind. The Corporation of the city were in a position to do an enormous amount of good for the poorer people, by giving them the opportunities, which they could not obtain except through the Corporation, of making the fullest possible use of gas. The Corporation had a monopoly of gas supply; and they had no right to trade upon the monopoly, and make huge sums of money to be wasted upon other things. They ought to do more in giving the poor people gas appliances, and afford them an opportunity of being able to reap the benefit of science as applied to the gas industry. He gave the toast with pleasure, because he was sure the Association was deserving of their heartiest support.

The President said it was not easy to reply to a toast put in words such as had been used by their Chairman, in that magnificent hall, in welcoming those present, and in furtherance of the efforts of this until that day modest Association. He (the President) rather dreaded that, after that day, the members would be all suffering from the malady known as swollen head [laughter]; but he hoped this would not interfere in the least with the progress of the work commenced that day. He echoed, and endorsed in the fullest possible way, the satisfaction expressed by the Chairman that the first meeting should have been held in Manchester. It had been his good fortune to have had association

with the City of Manchester at various times over a long term of years; and he had always felt with regard to their great Town Hall that it was the centre of more active industrial work than any similar place that he could think of in the world. The manner in which the Corporation had taken up everything likely to conduce to the benefit of the population, and at the same time to yield a certain amount of profit (about some of which there might be a little difference of opinion), was a matter that struck with admiration everybody who visited the city. With regard to their own Association, he (the President) confessed to a feeling of astonishment and gratification that it had "taken on" as it had done so quickly and so thoroughly. They regretted that at the present moment it did not muster within its ranks the whole of the gas industry represented by the gas companies and corporations throughout the Kingdom; but he thought that, having regard to the short time it had been in existence, it had done much to prove its claim to the general acceptance of those representing the gas industry throughout the country. He believed the anticipation of the Chairman would be realized before long, that they would have the organization very generally and cordially adopted. The point that had impressed him more than any other since he had been thinking of this gathering had been the fact that they had drawn together not only the manufacturers and purveyors of gas, but also those who were interested incidentally in the manufacture of apparatus and plant for use in gas-works and appliances for the consumers of gas. This idea of mutual interest was one of comparatively recent growth; but he hoped it had come to stay and to grow. If they did work in cordial unity, then he had no doubt whatever they would be able to better fulfil those duties that were eloquently explained by Mr. Councillor Kay—fulfil the obligations they owed to the community. He was quite sure that, in the houses of the poor, there was a field before gas suppliers that had been barely opened up; and if they prosecuted work in this direction, they would contribute something to the amelioration of conditions which, he did not hesitate to say, were a scandal and a disgrace to the country. If they were able in any way to deal with this great problem, then they would fulfil something of the duty that lay upon all men desiring the welfare of their country. He thanked the Corporation of Manchester and the Chairman and his colleagues of the Gas Committee for the magnificent and hearty reception and bountiful hospitality they had extended to the Association, and which he (the President) was quite sure no member of the Association would forget.

Mr. J. Ferguson Bell said the toast he had been asked to propose was one which would be cordially accepted by all present, as it was that of their estimable and worthy hosts (the Gas Committee) and the gas industry of Manchester. The members of the Association very much appreciated and thanked them for their kind and generous hospitality; but above all they desired to express their obligation, and to tender sincere thanks for the assistance and support so freely given to the Association by the Gas Committees of both Manchester and Salford. It seemed to him singularly appropriate that the first conference of the Association (whose aim was essentially commercial) should be held in the City of Manchester—noted the world over for its commercial enterprise. No more suitable place could have been selected, or one more likely to advance the gas industry, by making better known to the public the many uses and advantages of town's gas, and to overcome those lingering prejudices against its use which were founded upon theories that had no relation to modern conditions. The energy, resource, and inventive ingenuity of the people of Manchester and district had kept the city in the forefront of modern industrial development. Advances in science and industrial arts were turned to useful account; and new ideas were promptly seized upon and developed, which might in some measure account for the ready and cordial welcome extended to the Association. The members were more than pleased when two such keen and observant business men, as Mr. Councillor Kay, of Manchester, and Mr. Alderman Phillips, of Salford, discerned in the Association a valuable organization, capable of doing useful pioneer work, and also to discuss matters of interest and importance relating to the commercial side of the industry, and so commended it to their respective Committees, who had kindly extended to the organization the right-hand of fellowship. The members hoped to be able to demonstrate the necessity and value of the Association, and to more than fulfil the expectations of their many friends. They knew in these days of strenuous competition, intelligence, discernment, and enthusiasm were necessary in any business to ensure success, for all of which the Metropolis of the North was justly noted. The members of the Association hoped to absorb, and take back with them, more of this spirit. The vigour of the municipal life of the city was shown by the conspicuous success of the gas undertaking. A glance at the admirable statistics, compiled by the able Superintendent of the department (Mr. Price), indicated progress and development in all directions. It was not his intention to bore those present with a lot of figures; but he ventured to think two or three, giving the more salient facts, would be of interest, and perhaps supply some idea of the magnitude of the undertaking to which they all very sincerely wished continued prosperity and success. He was sure the citizens would be very glad to know that, in the City Gas Department, they had a solid asset of over two millions sterling. By this he meant the indebtedness stood at only £1,231,003; whereas the value of the works, property, and other assets was no less than £3,238,061. But this was not all; for, in addition, the appropriation of net profits in aid of rates, since the gas-works were taken over by the Corporation, amounted to the huge sum of £3,065,084. Evidently, the ratepayers had cause for congratulation in the possession of so lucrative an undertaking, which provided the handsome sum of £50,000 a year towards the reduction of the rates payable in the city. This was neither the time nor place to enter into the polemics of the desirability or otherwise of municipalities who own gas undertakings selling their chief product at cost price. There were good arguments on both sides; but, however this might be, he ventured to state that the gas consumers, owing to the wise and judicious management of the undertaking, had no cause of complaint, as the gas supplied was generally acknowledged to be both good and cheap. He noticed that the total income last year from all sources amounted to the large sum of £804,254, and the expenditure to £609,983—leaving the substantial amount of £195,271 gross profit upon the year's working. The length of mains within and without the city was no less than 958 miles—equal to five times the distance from Manchester to London. The number of consumers equalled the population of a large town—being 184,000. These figures he imagined indicated the extent and importance of the undertaking, and gave some idea of the responsibility and onerous duties attending membership of the Gas Committee, and of those who had to assure the good and efficient management of so important and vast a concern. He was certain the Committee and all associated with the department would desire, on such an occasion as this, to give honour to whom honour was due. He referred to the devoted and splendid abilities given for a long number of years, with a singleness of mind and ungrudging labour, by the late Chairman (Mr. Alderman Gibson). He was well known, highly esteemed, and no doubt very much of the success was due to his wise guidance and sound judgment. To find a successor to so able and experienced an administrator must have been a task of no ordinary difficulty. Fortunately the Committee induced Mr. Councillor Kay to occupy the position, and he had already happily proved an able successor to Alderman Gibson. Those who had the privilege of knowing Mr. Kay were confident as to the results of his administration, especially with the assistance of so able a Deputy-Chairman as Alderman Jennison, and a zealous hardworking Committee. However, in all such undertakings, the success or otherwise must of necessity depend to a large extent on the permanent officials; and it was well known how efficiently the Department was served, both commercially and technically, by the two chiefs, Mr. Price and Mr. Newbigging, and those associated with them. It had been his privilege and pleasure to know Mr. Newbigging for a number of years. He bore an honoured name in the gas industry; and by his engineering abilities he had placed the Manchester undertaking in the front rank. He referred to the magnificent piece of engineering work, designed and erected under his supervision—the 10 million cubic feet gasholder and tank, which to him (Mr. Bell) was a thing of beauty, although perhaps it might not be viewed in the same light by those who did not possess the same artistic taste for engineering structures. Further, it was well known that Mr. Newbigging was a pioneer in the new system of carbonizing, by which a well-known and highly respected Manchester engineering firm (Messrs. West) were adding to their already deservedly high reputation. Mr. Newbigging had been good enough to furnish him with the manufacturing charges for gas sold each year during the past ten years. From the figures, he noticed that there had been a continuous reduction in these charges, year by year, from 6·85d. per 1000 cubic feet sold in 1902 to 4·81d. last year. This reduction of 2·04d. per 1000 cubic feet in 1912 over 1902 on the gas sold (the enormous quantity of which amounted to 5423 million cubic feet) meant a saving of no less than £46,097—a result of which the Committee and all concerned might be justly proud.

Mr. Kay, in responding, said he wished all present to believe that it had given the Manchester Corporation Gas Committee very great pleasure to have as their guests this large assembly of gentlemen interested in the gas industry. He also wanted to say, in regard to what one read in the newspapers as to the rivalry between the Gas and Electric Lighting Committees, that the rivalry was very much exaggerated. It was purely a question of *£ s. d.*; and he wanted all to believe, as far as the Gas Committee were concerned, that they had no feeling in regard to the Electricity Committee. In their modern gas-works, they used electricity as motive power. They believed in taking hold of the handle end of the hammer, and in making good use of it. They could do so still to a much greater extent; and he hoped the Electricity Committee would pay the Gas Committee the same compliment. Now that they had at command a 10 million cubic feet gasholder, they would be able to give the Electricity Committee any amount of gas, and that at a cheap price. He did wish in all seriousness—it was his dearest wish—to see an interchange of commodities between the Committees. This would lead to the greatest good for the greatest number. He, the Deputy-Chairman, and the members of the Gas Committee, felt that, if they had done anything to add to the success of the British Commercial Gas Association, then their efforts had not been in vain. He would ask Mr. Newbigging to say a few words.

Mr. J. G. Newbigging (who was received with much applause) said he was very pleased indeed to be associated with his Chairman in responding briefly to the toast. He felt sure that, under the very able guidance of the present Chairman, Vice-Chairman, and the excellent Committee, the gas undertaking would make great progress during the next few years—greater, in fact, than it had ever done in the past. He had been looking through the figures of the undertaking for the last five years; and he found

that they had not made much progress with the lighting load. If their latest created doctor—Dr. Woodall—were consulted, he would agree with his (Mr. Newbigging's) diagnosis that this was due to the fact that they had not come into sufficient contact with their consumers, and that it was not in any sense due to senile decay. Although they had not made much progress with the lighting load, they had increased by nearly 25 per cent. the output of gas for purposes other than lighting. He should never be satisfied, and he thought the Gas Committee of the City Council should never be satisfied, until they were selling gas in Manchester at 1s. 6d. per 1000 cubic feet; and with very little exertion this was more easily obtainable than one was apt to think. Gas was more and more asserting itself as a most important agent for lighting, heating, and many industrial purposes, and as a most important factor in solving the smoke problem. In joining the Association, he felt the Manchester Gas Committee had made a very good investment; and if they used all the advantages to be gained from the Association, the expenditure would be returned to them a hundredfold. He should like to express his personal pleasure that the Association had chosen Manchester for their first meeting—Manchester and Salford he should say, because, although they were separately governed, in this matter they were bound together by ties of mutual interest. It would not be fair of him not to include Salford, because of the eminent services to the gas industry of Mr. Alderman Phillips, whom he had known nearly thirty years.

The Lord Mayor proposed the last toast—"The Visitors." He also expressed his gratification, and that of the Corporation and citizens, that the Association had chosen Manchester for the first annual meeting. The Manchester gas concern was the oldest municipal one in the country. It was fitting not only on this account, but on account of its being a great industrial centre, that they should have honoured Manchester as they had done. There was no doubt whatever that there was a new era for gas. Gas had been in front of the people for a century; and the Association were realizing, and quite wisely, that the gas industry had competition to meet, and competition always brought out the best that was in them. There was room for both gas and electricity. They had to think of the health of the people. At the present time, only a small percentage of the value of coal as ordinarily consumed in domestic grates was realized as heat—something like 70 per cent. of the actual value of the coal went up the chimney. If only all this coal was carried to the gas-works, and the resultant gas was used for lighting, heating, and other purposes, a great boon would be conferred. The Smoke Abatement Society were watching closely what gas committees and companies were doing throughout the country; and there would be general gratification that what had been done through the Association had tended so greatly to the promotion of both economic and sanitary ends.

Alderman Armitage (Doncaster), responding for the visitors, said there was an old saying that the liberal soul should be made fat, and he that watereth shall be watered also himself. It gave him great pleasure to be present and to speak for the visitors, in response to the call of the Lord Mayor, as he happened to come from one of the towns that possessed a Mansion House. There were only three in England—viz., London, York, and Doncaster; and since a Mansion House, as they all knew, connoted or implied good dining, therefore, he thought he could speak with some little authority on the point. Again, he had somewhere read that civilized man could do without books, but that he could not do without cooks. Also it had been said, "What was love but repining. Civilized man could not do without dining." In Yorkshire they thought things could be done on a grand scale, but after his experience in that city he had come to the conclusion that, as compared with Manchester, they would have to take a back seat. In conclusion, he said he considered the meeting augured well for the success of the Association.

THE FIRST ANNUAL DINNER.

The first dinner of the Association was held at the Midland Hotel on Tuesday evening. The President was in the chair. Among those present were the Lord Mayor of Manchester, the Mayors of Salford and Eccles, Sir Charles Behrens, Mr. Councillor Kay, Mr. Alderman Phillips, Professor Rutherford, Professor Harold B. Dixon, Principal Graham, Professor Vivian B. Lewes, Mr. Charles Hussey, Sir William Bailey, Colonel G. Gascoyne, Mr. S. Y. Shoubridge (Hon. Secretary, Institution of Gas Engineers), and Mr. T. S. Clapham (Chairman, Society of British Gas Industries). The Vice-Chairmen were Messrs. W. E. Price, Thomas Berridge, J. Ferguson Bell, H. James Yates, H. M. Thornton, R. S. Hilton, A. E. Broadberry, and Robert Watson. Among the numerous guests was Mr. S. L. Pearce, the Corporation Electrical Engineer. Prior to dinner, the President held a reception.

After dinner (to which about 400 sat down), and after the loyal toasts,

Mr. F. W. Goodenough said not many words were needed to commend to those present the toast of "The Gas Industry of Manchester and Salford." He might say that he had sought the duty of proposing this toast, because he desired, not only on behalf of the General and Executive Committees, but on his own personal behalf, to express indebtedness for the great hospitality the two Corporations had offered them, and for the assistance given in forwarding the efforts of the Committees. He should never forget the conference at the Salford Town Hall, which did so much to promote the movement in Lancashire; and he should never forget the readiness of the Manchester Corporation to give a lead to the support of the Association. He might say that Manchester had shown their practical sympathy by sending to the Association last Friday their cheque for £700 odd for the second year's contribution. There were in the mottoes of both Manchester and Salford most appropriate words to be applied to the Association. The motto for Manchester was "*Concilio et Labore*." If his Latin was not at fault, this meant "By counsel and labour;" and if this was not appropriate as a motto for the Association, he did not know what was. The motto for Salford was "Integrity and Industry;" and that also applied to the work of the Association. He wished to tender his hearty thanks to Mr. Councillor Kay and Mr. Alderman Phillips for their untiring efforts on behalf of the Association, as well as to the officers of both the Manchester and Salford Gas Departments, who had throughout given them most valuable assistance.

Mr. Councillor Kay, in acknowledging the toast, said he wished to say how much he looked forward to the good work of the Association with regard to its connection with the gas industry of Manchester. Publicity, in his opinion, was the greatest hope of the gas industry—the greatest hope for every gas undertaking from the highest to the lowest. He had a great belief that the efforts of the Association (which had had such a good send-off) would be to brighten many poor homes in the city, and indeed in the United Kingdom. If this result were achieved, they would feel that their efforts had not been in vain. He thanked all for the hearty way in which the toast had been received; and he might add that, so far as the Manchester Corporation Gas Committee were concerned, no efforts would be wanting on their part to make the Association a success—a success which, in his opinion, was deserved, and of which he felt quite assured.

Mr. Alderman Phillips also responded. He thought the members of the Association had been very kind regarding the little his Committee and himself had been able to do. But they must not forget one thing. He and his Committee had after all an eye on the main chance. [Laughter.] He had enjoyed the day's proceedings immensely; and he congratulated everybody on its great success. He believed the gas industry of the country and of the whole world would feel the effect of it. It would give an impetus to the use, and to a knowledge of the virtues, of gas.

Mr. H. James Yates said he felt it a great honour to be entrusted on this historic occasion with the toast of the "Institution of Gas Engineers." This was the first time in the history of the industry that they had had one supreme head representing the two branches of the industry's enterprise. Mr. Corbet Woodall was a man who was highly honoured, and who was peculiarly fitted to fill such an honourable position—a position embracing the Institution of Gas Engineers, the British Commercial Gas Association, and the Society of British Gas Industries. He also held the distinction of being the Governor of the Gaslight and Coke Company, who had been celebrating their centenary this year. The members congratulated most heartily their President on the honour conferred upon him at Leeds, as well as upon Mr. Carpenter and Mr. Newbigging, senior. One regret they had was that Mr. Newbigging was not able to be present at their conference; but he (Mr. Yates) was very glad indeed to learn that he had greatly improved in health. He believed those engaged in the Association were only on the threshold of a very great work. They would be simply as a voice crying in the wilderness unless they could feel that there was mutual goodwill on both sides of the industry. Looking at the various professions in the country, he was convinced that no profession contained more able men than the Institution of Gas Engineers; but there were few professions in which ability was less recognized. When one considered the long training that went to make a gas engineer, one was struck by the low remuneration that many of the members of the profession received. Unless remuneration was on an adequate scale, they would not find the best men coming into the gas industry, nor the best men remaining in it. The Institution of Gas Engineers never stood so high as now in their professional attainments or their commercial efficiency; and it was hoped the professional side would continue to be represented by men of the same high calibre, as at the present time. He coupled with the toast the name of the Senior Vice-President of the Institution (Mr. Edward Allen, of Liverpool). In Mr. Allen, he said, they had a prospective worthy successor to Mr. Woodall.

Mr. Allen said he was highly honoured by being asked to respond to this toast. They were disappointed that the President was not replying, but they all understood the importance of reserving the President's strength as much as possible. On behalf of the Institution, he desired to thank Mr. Yates for the handsome way in which he had spoken of it. Regarding the relationships between the Institution and the Society of British Gas Industries, he said the former had almost attained its fifty years of life; and the latter was many years younger. But he did hope the Institution would retain the pride of position as a technical Institution. He did not see any reason whatever why there should not be, though the Institution still occupied the premier position, perfect friendship and harmony between the commercial men and the professional men of the industry.

Mr. J. Bond proposed the toast of the "Society of British Gas

Industries." He remarked that he was pleased to see so many eminent engineers, scientific men, and commercial men representing the Society at the festive board. It must be admitted that gas had made very rapid strides in progress, owing largely to the energies of the members of the Society of British Gas Industries, who had effected improvements in lighting and heating apparatus generally. Much had been said about the mutuality of interests. The work of the members of the Society of British Gas Industries had helped on the sale of gas, and the increase in the sale of gas promoted the sale of gas appliances. Therefore, it was only right that all should help in the work of starting the British Commercial Gas Association.

Mr. T. S. Clapham (Chairman of the Council of the Society of British Gas Industries), in replying, expressed the pleasure of the members with all they had seen and heard at the conference. Mutual help was a thing he had been hoping for, and striving for, for a considerable time. In establishing their own Society, they had a pure motive; and they had an honourable position which they desired to fill in connection with the development of the gas industry and the interests connected therewith. They felt that the industry and its service had not been acknowledged in the world as they should be; and they determined that they would do something on their own side in the formation of a Society which should be looked upon with honour and respect. The members of the Society were delighted that they had been of some help in forming the Commercial Association, which was now celebrating the first anniversary of its birthday in Manchester. He liked the tone there had been about the proceedings. The members were not simply self-seeking. They wanted to promote and to protect their enterprise; and they also wanted to serve the community better. They wished to make the dwellings of the poor more habitable, and in every sphere to develop the use of gas, and so serve sanitary as well as financial interests. His Society had never withheld their hand in supporting the industry; and they might be depended upon to continue to do so.

Mr. Charles Hussey, J.P., proposed the "British Commercial Gas Association." In doing so, he said he proposed it from the commercial point of view. He was not a gas engineer; but he had the honour of being a Director of a Gas Company. As a man engaged in business, it had been a great pleasure to him to be there, and to listen to their proceedings. In the paper that had been read by Mr. Yates, the author threw out many commercial points that commended themselves to him. In regard especially to advertising, it must strike anyone engaged in commerce that advertising was of the utmost importance; and he was very glad indeed the Association had made a very strong point of that in its schemes. Combination meant strength; and it was clear that no single gas company could be as useful standing alone as in combination. This had been a point in the Committee's annual report, and Mr. Goodenough had supplied illustrations of the beneficial and economic effects. In his (Mr. Clapham's) opinion, every gas company and every corporation should subscribe to the Association. He had no sympathy with any gas company or corporation who could sit down, receive benefits from the work of the organization, and yet not subscribe anything towards the carrying on of the work. He was very pleased to say that Mr. Woodall had been for many years a colleague in the direction of a gas company of which he (Mr. Hussey) was the Chairman; and he brought to their deliberations a knowledge the Directors as a body found most valuable. They looked upon him as their guide, philosopher, and friend.

The President, in his response, said he desired at once to say how gratified he was, in common with all the members of the Committee of the Association, with the magnificent success of their meetings that day. Something had been said about co-operation. Co-operation and co partnership had been in the air all day. He was an earnest and convinced believer in co-operation between employers and workmen; and the Association was but an extension of the idea, which he believed had as beneficial an effect on the work in hand as co-operation between employers and men. He had a word to add, and he spoke it with some diffidence. But the remark made by Mr. Yates—in fun, should he say?—had to him (Mr. Woodall) a very serious side. Mr. Yates spoke of the unfair remuneration of those engaged in prosecuting the industry of gas. He (the President) did not think that, judging by other industries, the term was quite merited. But he had the strongest feeling that, when they asked from men, such as those at the head of their industry, to give them the undivided, loyal service which was required, the latter had the right to ask that the remuneration paid should be adequate. He would illustrate this by a little incident that happened many years ago, when he (the President) first came to London. His Directors asked him to leave the room. Many of them present knew what this request meant. [Laughter.] Then they called him back again, and informed him that they had decided to increase his salary. The Chairman, with a considerable amount of hesitation and diffidence, told him that they had done this with great pleasure; that they were quite aware of the temptations which were put in the way of those who had large sums of money of which to dispose; and that they hoped (he adding "do believe this is without any personal application") that their engineer would be like Cæsar's wife, above suspicion. His (the President's) response was that what they had done would help him to do more easily in the future what he had tried to do in the past, but he added that he was often surprised to find how directors required of their officers absolute purity of conduct, loyalty, and devotion, while they fixed their remuneration at a rate which they knew to be inadequate to the duties performed. These sentiments he held forty years ago; he held them as strongly to-day. This was, however, by the way; but he could not refrain from mentioning the matter after the observations that had been made. They were looking forward to hearing Professor Lewes directly; and although this was a most inadequate response to the toast, they must excuse its brevity, and perhaps its inapplication. This might be the last time that they would see at one of their own meetings the Lord Mayor of Manchester and the Mayor of Salford together; and he could not help taking the opportunity of saying again how much the Association owed to them, not only for their hospitality, but for the cordiality of their assistance and kindness.

Mr. H. M. Thornton proposed "The Visitors." He remarked that very sincerely the members of the Association appreciated the fact that their invitation to dinner had been accepted by so many distinguished gentlemen, including the civic heads of the City of Manchester and the Royal Borough of Salford.

The Lord Mayor, in reply, observed that the visitors were all very glad to have seen the Association there that day; and, what was more, he hoped they had learnt from the visitors. Gas companies had been in existence for something like a century; and now that they were feeling competition, they were rising to the occasion. He hoped the Association which had now been inaugurated, and successfully inaugurated, might have beneficial results. There was no doubt whatever that every gas company, every municipal gas undertaking, who joined in this work, and who took their fair share of what was being done—the expenses were slight, and the benefits would be great—would progress, and be able to reduce the price of gas. He was sure they could reduce the price of gas. Commercial men knew that residual products were greater in value than they were twenty years ago. It was therefore quite possible for them to reduce the price of gas, and for the gas to be used for many purposes for which it could not be used in the past. If they did this, they would not only increase the profits, but they would work a great benefit for citizens and the community generally. In this country some 260 million tons of coal were raised annually. Out of this they exported something like 60 million tons; and about one-third of the balance was used for domestic purposes. Something like 70 per cent. of the thermal value of the coal was wasted, besides the other useful constituents it contained. If all the coal could only be treated by the present carbonizing methods, and the gas used for heating, the gas industry and the community would benefit. This was one of the commercial aspects of the case; and if the Association worked in this direction, great good would be accomplished. He hoped the Association would go along and prosper; and that, in course of time, the members would see their way to come back again to old Manchester. [Cheers.]

The Mayor of Salford remarked that he noticed from the literature of the Association that had been sent to him that there were gas undertakings in the country who had not joined the Association. But when he saw the members of the Association, and the enthusiasm they all evinced, he thought the Association might be congratulated upon the great success achieved in this their first year. It was dangerous to prophesy; but he would venture to prophesy that next year they would have a very large addition to their membership. On behalf of the visitors from Salford, he must express the exceeding great pleasure they felt at the way they had been entertained at this the first dinner of the Association. He believed that from the Association, their work, and conferences, beneficent results would accrue.

Reception of Ladies by the Editor.

While the dinner reported above was in progress, the Editor of the Association (Mrs. M. A. Cloudesley Brereton) entertained to dinner in the Ball-room suite—before holding a formal reception, and prior to the lecture by Professor Vivian B. Lewes—a few ladies engaged in public work in the district, to meet the Lady Mayoress of Manchester and the Mayoress of Salford. The guests, besides the Lady Mayoress and the Mayoress, included Mrs. Alderman Frankenburg (ex-Mayoress of Salford), Councillor Jane Redford (Chairman of the Ladies' Public Health Committee), Miss Maud Taylor (Examiner in Domestic Science), Miss Burstall (of the Education Committee), Miss Phillips (the Deputy Mayoress of Salford), Mrs. Alderman Kay, and Miss Jenkins. At 8 p.m., the Editor, accompanied by the Lady Mayoress and the Mayoress, adjourned to the ante-room of the Ball-room, where they received their guests, who afterwards passed on to the great Ball-room, where those ladies who had been present at the Editor's dinner helped to entertain the guests. Light refreshments were served and an excellent string band played. A well-fitted and artistic gas-fire warmed the room, and was very much admired. The women doctors, health visitors, educationists, trained nurses, and others present had an opportunity of an hour's very interesting and useful talk with the Editor and with each other, in a friendly and informal manner, upon the advantages of gas in the public health campaign, and in the coming economic household revolution in all classes of the community.

At the close of the Association dinner and the reception by the Editor, the two large companies joined forces, and passed to the theatre to hear the interesting lecture (reported elsewhere) by Professor Lewes. There was much pressed into this one evening; but the time sped through its varied character—both enjoyment and instruction being extracted from it.

LUNCHEON AT SALFORD.

After noon the following day, private trams were provided to convey the members and visitors to Peel Park, Salford, where they were to be the guests at lunch of the Salford Corporation Gas Committee. The President of the Association was, of course, the honoured guest—sitting at the right-hand side of the Chairman of the Gas Committee (Mr. Alderman F. S. Phillips). The Mayor and Mayoress of Salford were present; and the Lord and Lady Mayoress of Manchester, as well as Mr. Councillor Kay and others, came over from the city as guests of their neighbours. There was a large company—so large, in fact, that there was an "overflow" dinner in an adjoining room.

The CHAIRMAN, in proposing the "British Commercial Gas Association," said he had had a somewhat varied experience of public life, but he must confess that he had never taken part in a movement which showed such an immense amount of vitality and such verve and go as had these meetings of the British Commercial Gas Association. This augured well for its future. If this was the infant, what would it be when it got to youth and manhood? [Applause.] He was convinced that this work marked a new era in the service of gas, and all that appertained to it. While all who had been invited to these meetings were not at the present moment members of the Association, he hoped the meetings would be the preliminary to their joining the Association. The way the meetings had been organized and carried through spoke volumes for the cause of gas. He welcomed all who had come from north, south, east, and west to join in the remarkable conference. When they came to their second conference, he was confident they would find the history of the second twelve months' working was one of progress, useful work accomplished, and greater strength.

The PRESIDENT, on behalf of the Association, thanked Alderman Phillips for the kind manner in which he had proposed the toast and for the anticipations expressed with regard to the future of the Association. They had a good cause; and he was delighted to hear from all who had taken part in the meetings but one testimony as to the quality of the men who were carrying on the work. He believed the men associated with this work had it within them to make it a very brilliant success. There had been so much talk during the two days, that he would content himself with saying now how much the members of the Association appreciated the dignified and courteous way in which they had been received by the city of Manchester and the borough of Salford. The Association had had a send-off as perfect as they could have hoped for. He could hardly expect that it would be his lot to take any part in more than one or two further meetings of the Association; but he was sure that the enthusiasm that characterized those present there that day was a guarantee that the work would be carried on with vigour. He could think of nothing more promising as to the harmonious working of the combined societies represented in the British Commercial Gas Association than his experience in presiding over the meetings during the past two days. "May the Association prosper very much" was his sincerest wish.

Mr. R. WATSON proposed the "Gas Industry of Salford." He remarked that they were particularly indebted to the Gas Committees of Manchester and Salford for the help rendered to the Association at its inception. When the original publicity scheme was first spoken of, Alderman Phillips was one of the gentlemen whom they welcomed. He entered into the scheme, and became one of their warmest supporters. He was one of their strongest friends that day. They were indebted to such municipal undertakings as those of Manchester and Salford for the help they had accorded in the progress of the Association. What they had done had induced other corporation undertakings to come in. They had to thank the Salford Gas Committee for their invitation to lunch that day. The attendance indicated the character of the welcome; the attendance also indicated the cordiality of the members of the Association towards the Salford Corporation.

Alderman PHILLIPS thanked the mover of the toast for, and those present for their endorsement of, the kind words that had been used regarding the Corporation and Gas Committee of Salford. It had been an agreeable part that they had been able to take in starting the Association. He also mentioned that the arrangements for the conference had been made in unbroken amity by Manchester and Salford; and between them—Manchester had taken the greater part—they had done what they could to make the meeting a success.

Mr. W. W. WOODWARD (the Corporation Gas Engineer), called upon by his Chairman, said it gave him great pleasure to have the opportunity of saying a few words. He was proud of his position in Salford. He had been connected with the gas undertaking now for about 28 years; and he hoped to be there 28 years longer. [Laughter.] He thanked them all for the toast. People had been saying that the gas industry was dead. The sales of gas, it was said, were decreasing. It was simply nothing of the kind. In reply to many of his friends who told him this, he said (and he always got the same reply): "If I were in the position to make you a present of £1000 of ordinary shares in either a gas company or an electric supply company, which would you take?" With one accord they replied "the gas stock." [Laughter.]

Mr. A. E. BROADBERRY proposed "The Commercial Sections." This was, he said, the most fitting and appropriate place in which the toast could be proposed, as it was in this district of Manchester in 1906 that the Commercial Section movement was first inaugurated, following the formation of the Society of British Gas Industries. He gave an outline account of the work of the Commercial Sections, pointing out that the example set by the Manchester District Institution had been taken up and copied by other District Gas Associations in the country. One of the earliest districts to follow was the Southern Association; and had it not been for the Southern Association, the British Commercial Gas Association would not now have been in existence. It was following on a paper read by Mr. Goodenough at the Institution meeting in Dublin, and one by Mr. T. E. Pye before the Southern Association, that the Commercial Section of the latter started the idea of a Publicity Committee. It was referred to the Institution; and they in turn referred the consideration of the matter to the Commercial Sections of the various District Associations. The Manchester Institution took it up whole heartedly, and other District Associations joined in, with the result now before them.

Mr. W. E. PRICE, in replying, remarked that he thought those present would agree if there was one piece of work more useful than any other that the Commercial Sections had done, it was the production of the British Commercial Gas Association.

Mr. H. KENDRICK said the Manchester Commercial Section were proud of the part they had taken in the foundation of the new Association. In his opinion, the Commercial Sections did as much good for the industry on the whole as the work of their engineering organizations.

The MAYOR OF SALFORD proposed the toast of "The Visitors." He did this with the greatest pleasure, because he believed that, by encouraging these meetings, the British Commercial Gas Association was doing a great deal toward convincing the professional and scientific men of to-day, as well as the general public, that gas properly and reasonably used was perhaps the most economical of all fuels, and the cheapest illuminant. Let him say, in the first place, that he was highly pleased that the Association should have thought fit to hold one of its first meetings in Salford. Councillor Kay said the previous day that Manchester was the best place in which to hold the first meeting of the Association; and while being too modest to contradict him, he (his Worship) ventured to think that Salford was, at any rate, the second best, if not actually the best place, for it was in this borough that a system of gas lighting was first installed. He thought that the Association had a great future before it, and that the national publicity campaign which it had now entered upon would, in due course, yield a great deal of business, to the benefit of the gas undertakings generally throughout the country. He felt that the meetings of the Association in Manchester and Salford would not have been in vain. Much information had been given in the Press and in the special papers read which could not fail to rouse public interest; and therein laid the great secret. Effectually rouse the public interest in any matter, and the object one was aiming at would be very quickly accomplished.

Mr. A. F. SHELDON, in replying for the visitors, remarked that it had been his privilege to be present at the birth of many associations, but he could say, without any charge of sophistry or flattery, this had been the greatest meeting of the kind that it had ever been his lot to attend.

Mrs. CLOUDESLEY BRERETON, in proposing the toast of "The Press," heartily thanked the London and Manchester newspapers for the publicity given to the proceedings of the Association.

The lecture on the "Science of Salesmanship," given by Mr. A. F. SHELDON, the founder of the Sheldon Schools for Business Building, was delivered immediately afterwards, to a large and very appreciative audience; and then the members and visitors separated, full of the interest and enthusiasm engendered by the two days' conference.

PAPERS AND DISCUSSIONS.

THE AIMS AND CLAIMS OF THE "B.C.G.A."

By H. JAMES YATES, F.C.S., M.Inst.M.E., of Birmingham.

Before addressing myself to my subject, I desire to ask you, from the outset, to have in mind that this is in no sense an official paper. I am not speaking in my capacity of Vice-Chairman of the Executive, nor as a Vice-President of the Association. In what I propose to say, I hope and believe I shall be expressing the views of most, and possibly all, of those responsible for the direction of the Association. But I shall be setting forth not any definite official programme of the Association, but things at which I, for my part, earnestly desire to see it aim at, and the claims which, to my mind, it has on the support and sympathy of every gas maker and gas apparatus maker in the kingdom.

The Aims of the Association.

Dealing first with what I suggest ought to be the aims of the Association, I begin with three points which are fully official—having appeared in the Executive Committee's report of the 5th of March last. The first is to make gas better known to the public; the next is to remove prejudice; and the third, to offer expert advice and assistance in the development of local activity and in dealing with local emergencies.

Publishing Truths—The "Positive" Aspect of Our Publicity Work.

The carrying out of the first of these three aims will, no doubt, be chiefly by means of advertisements in newspapers, magazines, and periodicals, carefully selected as suitable media for the purpose, and by occasional contributed articles in suitable journals. The authors of these advertisements and articles will not content themselves with merely saying that gas is the best, still less will they say that Brown's lamps and Green's stoves, and they only, are the best. They will deal with gas generally in a reasoned and weighty fashion—the objections to it, the answers to these objections, the advantages of it, and the various uses to which it can be economically put.

Removing Prejudices—The "Negative" Aspect of Our Publicity Work.

The next point is the removing of prejudice; and prejudice arises from two things—ignorance of the facts, and misrepresentation of them. Our work under the first head will in time largely overcome the ignorance; the misrepresentation from interested and unscrupulous sources will require more controversial methods. We must deal trenchantly with the misstatements and suppressions of essential facts that so often characterize the controversial methods of some classes of our electric competitors. And here I know I shall carry with me all concerned in municipal electric management; for they are in a position to hold the balance between gas and electricity, and to recognize the legitimate sphere of each and their respective advantages. In this direction, I am confident there will be little controversy and no acrimony. It is in respect of improper controversial and advertising methods of individual champions of electric current and apparatus here and there over the country, that we hope to do excellent work in confuting and exposing—and that in no partizan spirit, but in strict adherence to verified fact, and, I hope and believe, always in perfect temper and good taste. We shall attack no man and no industry; our task is not to make attacks, but to repel them. We only need to spread the truth about gas, and that truth will carry conviction with it.

Proffering Help and Expert Advice.

The third of the objects of the Association which I have quoted is the offering of expert advice and assistance in the development of local activity, and in dealing with local emergencies. This will, I trust, as time goes on, become a very important and valuable branch of the Association's work. The Association will gather, and tabulate, and record information and arguments bearing on the interests, uses, and advantages of gas, in a way which individual local gas authorities and officials are little likely to have the time or the opportunity to do; and when a local gas undertaking finds itself confronted by any problem or controversy such as would come within the scope of the Association, a letter stating the matter to the Association will bring the very assistance needed. This is a point to which I propose to make further brief reference in a later part of this paper.

Methods for Organizing Co-operative Service.

How are these aims—and others I shall mention later—to be attained? Of course, the Association is already in full working order, and much good work has been already done. Indeed, some part of the credit for the exceptionally prosperous condition of business all over the country in many classes of gas-consuming apparatus may not unfairly be claimed for, among other contributory causes, the work of the "B.C.G.A." But we are only, as yet, on the threshold of things, and we have a great deal further to go. We cannot expect the Association to run before it walks.

Need for Augmenting Staff if Field of Usefulness to be Enlarged.

For one thing, we ought to have a larger staff at our offices; and in that staff should be included at least one expert technical man (one to begin with!) who can handle problems and difficulties on technical and scientific lines. Such a man, or men, would also be able to contribute initiative and technical knowledge towards a different kind of advertisement from that which can possibly be produced from any non-technical source. Our present advertisements are excellent of their kind, and it is a very good kind, and a highly necessary one; but we also need another kind, which shall be technical, scientifically argumentative, and aimed at overcoming objections or prejudices on technical grounds.

Advertising for Special Classes of the Public.

To give you one example of what I mean—some gas authorities, and some gas-apparatus makers, have been for some years past spending a good deal of money and effort on trying, by special literature, containing arguments based upon scientific and hygienic grounds, to convince the medical profession as to the advantage of certain important uses of gas, and also, by technical literature specially adapted to the purpose, to persuade architects to make provision in house designing for such uses of gas, as being the method of the future. But I should like to see not only these two professions but every other profession and class concerned, plied with suitable literature, specially addressed or adapted to the particular section or class, and coming to them with all the force of the "B.C.G.A." behind it, and impressing these classes, not as the work of private or interested parties, but of a body—not, indeed, disinterested, but weighty and responsible. There is an enormous work yet to be done in this direction, in no passing and spasmodic way, but in a steady, well-planned, and continuous campaign.

The Expert—in Science and Salesmanship.

If we are to break fresh ground by taking up an active progressive policy in such ways as I have indicated, and bringing home our position to the public by the help of scientific data, such expert assistance on our staff as I have mentioned is indispensable, and would be fully and profitably employed.

A "B.C.G.A." Laboratory.

What developments may eventually arise in the working out of the possibilities of this Association it would be idle for anyone to attempt fully to foreshadow or foresee; but there is another important thing which I think we ought to aim at, if not to-day, at least before long. If we are to have a well-equipped technical man to advise us, we must sooner or later have laboratories and testing-rooms of our own, so that he may be able to verify at first hand the points he is dealing with.

A "B.C.G.A." Hall-Mark.

I hope to see these laboratories and testing rooms established all the earlier, because of the great work they can do in another direction. In these laboratories we ought to be prepared to examine, test, and, so to speak, "hall-mark" various kinds of gas apparatus. Such a "hall-marking" arrangement would quickly become of the greatest value to the gas industry, as it would give assurance to those purchasing apparatus, but not themselves having the facilities for adequate test; they would no longer be at the mercy of interested statements made by competing manufacturers. Such an arrangement would also quickly establish a very high standard for all such apparatus. The less good would

have to improve itself, so as to come up into line with the best; the best would have an added incentive to maintain its level, and to become, if possible, better still. I am certain that in a very short time the hall-mark of the Association would take a very high position as the recognized standard throughout the whole industry, and among the public, and would greatly improve the position and prospects of gas by ensuring that apparatus of inferior quality or improper design should not be allowed to misrepresent to the public the value of gas for the various uses for which it is so admirably suited. I look forward to the not distant time when every gas appliance will bear alongside the patent number and maker's name a device indicating that it had been hall-marked at the "B.C.G.A." laboratories, and every advertisement of such apparatus would bear the same sign.

The Claims of the Association.

Having dealt with such points as, in my judgment, ought to be among the aims of the Association, within the near future, I turn now to the other part of my subject, the claims which the Association has on the support of all those connected with the gas industry. Manifestly, the first claim is that of membership; and it may be most convenient if I deal first with gas undertakings, and the reasons why those of them who have not yet joined ought to do so, and then with those of my own side of the industry—gas-apparatus makers—who may be in the same undecided state of mind. In dealing with the first, I shall be largely dealing with the other at the same time.

The Association's Claims on the Gas Manufacturer.

You *ought* to join. The Association has a claim to your support, because of the work it is doing, and the greater work it is going to do, for the industry to which you belong. If it accomplishes the first two of its three primary aims—viz., making gas better known to the public, and removing prejudice—it will do your undertaking good, whether you co-operate or not. But you would not wish for a moment to enjoy the good yielded by the labours and outlay of others without bearing your share; and that being so, I shall take it that the moment you are satisfied that the Association is going to benefit your undertaking, you will join. My task, then, is to satisfy you as to the good it will do you. The proposition is susceptible of so convincing a proof that if I fail to satisfy you, the fault will lie with me, certainly not with the Association.

The General Press and General Publicity.

To begin then, the London daily and weekly papers and the magazines in which the Association advertise, find their way all over the country, and the provincial papers selected for the same purpose, cover a wide area. They are bound to reach many people within your district; and if they reach them, they are equally bound to influence a certain proportion of them to your advantage.

Local and General Publicity Complementary, not Mutually Exclusive.

I think this first proposition will hardly be seriously questioned by anyone; and that as regards those undertakings that do no local advertising themselves, it is clear that the Association cannot but do them considerable good. But there may be some gas authorities who happen to be themselves among the moderate number who carry on an advertising propaganda locally, and who have the impression that on that account the work of the Association would be superfluous in their case, and afford them no advantage. Now in answer to that, the view which I have already put before several undertakings, and which I should now like to put before all, is this: The more progressive the undertaking, the more local advertising it does, the greater the benefit it will derive from publicity work of a general nature such as that of the "B.C.G.A." Both my own experience as an advertiser on a fairly large scale, and the general experience of those who advertise is that, to spend less than *enough* is to lose a great deal of what one spends, whether it be much or little. It is the last £100 or £1000—sufficient to make the total amount "enough"—that brings the full value out of all that was spent before.

The Rationale of Advertising.

An advertisement succeeds with people by four things: (1) The number of times that they see the advertisement; (2) the number of media they see it in; (3) the convincing nature of the advertisement itself; (4) their need of the thing advertised. Suppose an advertisement of a commodity known as—shall we say?—Koltarro. The first time it meets a man's eye, he does not see it at all. If he never meets it again, this one time is lost, so far as he is concerned. If he does meet it a second time he just barely notices it. Should that be the last time, these two occasions go for nothing. The third or fourth times (if there be a third or fourth time) he has a vague notion that surely he has seen this before.

Cumulative Effect.

The spell is beginning to work. The fifth time (or the fifteenth, or the twenty-fifth—that depends on the man and his need of Koltarro) he says to himself: "That Koltarro must surely be a good thing. I must try it one of these days." Even then, if he sees the advertisement no more, the effect of the whole five, or fifteen, or twenty-five may be lost. But again it meets his eye—perhaps this time in a paper where he has never come across it before—and this clinches the matter; he goes in for Koltarro. Advertising—skilful, persistent, and widespread—has captured him. Is it possible to have these three qualities in your local advertising? Skilful it may be, though advertising to-day as a rule wants a specialist. Widespread it cannot be, for "widespread" and "local" would be a contradiction in terms. Persistent it will seldom be; for you will not be willing to spend such sums on advertising as the "B.C.G.A." is designed to do. And yet if it is to do good, the reader must see it in his full five times, or fifteen times, or twenty-five times; else the effect will be lost.

The "Universal" plus the "Local."

Look at the matter another way. Merely local advertising, however good it may be, can never take the place of general publicity such as is undertaken by the "B.C.G.A." An advertisement which a man sees over and over again in his local paper, and nowhere else, does not appeal to him with the same force as one which he sees not only there, but also in the magazine or weekly paper he takes in, and in the odd one he picks up at the club, the restaurant, or the hairdresser's. The advertisement in the local paper may start some interest in his mind; that in the magazine gives the finishing touch. The first lays the paper, the wood, and the coal (to borrow an illustration which gas-heating and the "B.C.G.A." publicity campaign are fast rendering obsolete!) but it is the advertisement in the magazine, or the non-local periodical, that sets the match to it. When the Irish policeman produced three prisoners whom he professed to have arrested single handed, he was asked by the magistrate how he could possibly have managed such a feat. His answer was: "Plaze, Sor, I surrounded them!" Not being an Irish policeman, you cannot yourself, by your own unaided local advertising efforts, "surround" your intended consumer. Join hands then with the "B.C.G.A." in their general advertising scheme, and so you will form around him a ring out of which he cannot possibly escape.

Varying the Point of View.

It is not only that the "B.C.G.A." advertising addresses a man in different papers from those that you employ; it addresses him from a different standpoint, and in a different way. When he sees your advertisement, no matter how deftly the hook may be concealed among the bait, he is apt to dismiss the matter with the thought that it is simply the local gas people wanting to sell more gas. The "B.C.G.A." advertisements, on the other hand, are naturally of a more general kind, and they come with an air of authority, and even of judicial impartiality, which cannot but impress him. I am confident that the "B.C.G.A." advertising is going to make effective much local advertising which, for the reasons I have given, has hitherto failed.

The Economy of Co-operation—The Best Writers and Artists Available.

Then the "B.C.G.A." has prepared most useful booklet literature such as few undertakings could have the opportunity of getting up for themselves; and the quantity got out permits this to be supplied at a cost far below what any undertaking, working single-handed, could command. Here again is a substantial advantage, the "open sesame" to which is membership of the "B.C.G.A."

Joint Control of Municipal Gas and Electricity Supply.

I have heard of one or two municipalities who, because they own both gas and electric undertakings in their towns, have the impression that they have nothing to gain from

the work of the Association. But this, I suggest, is entirely to misconceive the use of advertising in general and of our Association advertising in particular. Our advertising, being defensive, not offensive, will not meddle with electricity where (as in such circumstances would be the case) electricity does not attack it. As I said a little while ago, gas and electricity have each its own sphere. There are two classes of people chiefly who are to be addressed by the Association's advertisements—those who are not using gas at all, and those who are not yet using it for all the purposes for which they could with advantage do so. Now this advertising is not going to capture business from the electric department; it is going to create absolutely new business. This is the all-important point which is apt to be sometimes forgotten. "Robbing Peter to pay Paul" would, of course, be wasteful and useless; but creating new business, by opening up new uses and outlets for gas, is a very different proposition, and one which I am certain has only to be understood by municipalities having control of both departments, to change altogether their attitude to the question.

The Association's Claims on the Gas Apparatus Manufacturer.

Now I come to the reasons why gas apparatus makers should join the Association; and in urging the matter upon gas undertakings, I think you will see that indirectly I have dealt with the apparatus makers' case as well. To paraphrase a saying which is often used in present-day politics, "Every vote for gas is a vote for gas apparatus." If the "B. C. G. A." advertising persuades people to use gas for purposes for which they have not used it before, or to use it in larger quantity than before, they must use it in gas apparatus of some kind or another. So every time that a convert is made by this campaign, not only does some gas undertaking score, but some gas apparatus maker scores as well. Some of the advertising methods on which many gas apparatus makers have hitherto relied are, frankly, becoming more or less old-fashioned. Put some of your strength into the common fund, and the newer methods of the "B. C. G. A.," carefully adapted to the needs of to-day and to-morrow, will do as good work for you as you can hope to do for yourself. You specialize in gas-apparatus; they will specialize in advertising gas; and your apparatus will reap its share of the benefit. Of course, you must still advertise. The business of the "B. C. G. A." is to persuade the public by their advertisements to use gas; your business is to persuade them by your advertisements that yours is the apparatus to use it in, and to go on improving your own particular apparatus with each and every advance made by modern science as applied to any branch of the industry, so that you may be certain that your own apparatus will remain the best in its particular field. For my own part, I shall not spend a sovereign less on my own Company's advertising, nor in their laboratories, than I have done in the past; and yet I am satisfied that my Company's subscription (through the Society of British Gas Industries) to the "B.C.G.A.," is going to produce excellent value for the money.

The Case of the Gas-Plant Manufacturer.

The case is equally strong in regard to the manufacturers of gas-making and gas-measuring apparatus. I ought to have mentioned them first, for they will benefit certainly not least. More gas to be sold, means more gas to be made. If the "B.C.G.A." propaganda does half the good that is reasonably expected from it, the existing gas-making plant at most works will have to be largely augmented. No branch of gas-apparatus manufacture stands to benefit more generally than that of gas-works apparatus, and none more substantially.

I hope I may have succeeded in showing good cause why all gas undertakings and all gas-apparatus makers should become subscribers to the "B.C.G.A." Let me, in conclusion, point out briefly some ways in which, once you have joined, you can help the work of the Association.

Reciprocal Help—Five Points of Contact.

1. The first is by bringing up your subscription to its full proportion. Without adequate funds, we cannot properly carry out the aims that I have sketched. With everyone in the industry fully subscribing, splendid work is practicable in the immediate future.
2. You can bring to the Secretary's notice any statements adverse to gas which you may have observed in any public prints, so that, if it be thought necessary, they may be controverted.
3. You can acquaint the Secretary with any special objections or impediments to gas, or to any special use of it, which may have come within your experience, and of the manner in which you, or another, may have been able to overcome it—this in order that the Secretary may have the case recorded against the event of the Association being consulted regarding any similar circumstance from some other quarter.
4. Where such a difficulty is met with, and you are not in a position to overcome it, consult the Association Headquarters, giving them full particulars; and advice will be given as to meeting the difficulty, or, if it be a case of controversy, the accumulated data and experience of the Association will be at your service to assist you in making a convincing reply or conducting a diplomatic correspondence.
5. Communicate to the Editor of the "Bulletin" any news which may be of service to the Association at large. She wants to make the "Bulletin" as broadly interesting and useful as possible.

A Last Word.

The present is no time for timid or niggardly views and action. We are on the threshold of a great enterprise. One thing, and one thing only, cou'd possibly make the enterprise fail, and that would be half-hearted support, or no support at all, from those it is designed, and well fitted, to benefit. Happily the prospects all augur general and hearty support; and I am persuaded that few indeed will covet the unenviable distinction of having so far misjudged the future of the Association and the work it is going to do, as to seek shelter in the Cave of Adullam, while the industry as a whole is united in a great and prosperous forward movement, which already gives promise of the splendid harvest with which it is to reward the courage, the large views, and the enterprise of its members.

Discussion.

Mr. F. J. West (Manchester): It is not with the intention of opening the discussion that I rise, but to propose a cordial vote of thanks to Mr. Yates for his very admirable and useful paper. In doing so, let me say at the outset, as a representative of the Society of British Gas Industries, that the members of the Society upon the Committee of this Association fully appreciate the opportunity that has been afforded them to co-operate with the other members of the British Commercial Gas Association. We realize that the more gas that is made, the more business and trade will there be for us; and it is in a spirit of rendering mutual aid and co-operation that we have joined the Association. I think that one of its outstanding features is the very wise selection of Mr. Goodenough as the Chairman and Mr. Yates as the Vice-Chairman of the Executive Committee. Mr. Yates is nothing if he is not an optimist; and it is the spirit of optimism that has placed this Association in the position in which we find it to-day. I sincerely hope that Mr. Yates's paper will not only appear in the Technical Press and be placed on the records of the Association, but that it will be reprinted and sent out to those companies and corporations who are wanting information as to the aims and objects of the British Commercial Gas Association. With these few words, I have very great pleasure in proposing a hearty vote of thanks to Mr. Yates for his most admirable paper.

Mr. W. D. Helps (Leeds): It affords me very great pleasure indeed to second this vote of thanks to our worthy friend and hard worker. I think, gentlemen, you will all agree that the assembly here to-day speaks volumes in favour of the co-operation of the two sections of the gas industry—the producers of gas and the suppliers of apparatus—and that it augurs well for the future of the industry. Furthermore, I notice that throughout Mr. Yates's paper there was the suggestion of acting on the defensive rather than on the offensive; and I think if we keep to these lines, and do not attack our friends who are competing with us, we shall do good work. I am quite sure there is work waiting for both the gas and the electric light industries. We have evidence of it even in gas-works, where it is no uncommon thing to see a retort-house lit by electricity. We do not want to tread on their toes, so long as they do not tread on ours. We do not want the funds of the gas-works to go

to supply the shortcomings of the electric light undertaking. We are here simply to hold our own, and to act squarely one with another in this glorious co-operation of the gas makers and the manufacturers.

Mrs. M. A. Cloudesley Brereton: Mr. President and fellow-workers, the only point I have to speak upon is one which comes almost last, but not least, in Mr. Yates's paper, and that is the plea for co-operation in the work of the editor—not only the editor of the "Bulletin" of the Association, but the editors of all the official publications and advertisements. I have first to thank all the members for their hearty co-operation from the beginning. I dare say if you saw my morning post you would think that I am a very bold woman to ask for more correspondence; but I do ask for it, because I think every member of the Press here present will agree with me that one of the essentials of running a journal of any sort—especially one in connection with a specialized industry—is to give every opportunity for the introduction of new blood. I am very anxious that in the "Bulletin," in all the articles that I contribute to the General Press, and in any papers I may write for the Technical Press, I should be helped by those who are actually in the work with points that I could not possibly find out for myself. I do try to go a great deal into works and to inspect them; but it is the man who is in the works who can write me suggestions for articles on any little points that may come in to "point a moral" and help to illustrate a fact. I sometimes feel that the articles which come to me, and which suffer most from the editor's blue pencil, are the most valuable in the end. The man who is doing the engineering work is not necessarily a journalist; but he can supply me with the raw material that no ordinary literary man could do. Therefore I do beg of everyone to feel, when he is sending any contribution, that it is being sent to as sacred a shrine as if it were given to a priest in the confessional, and that it will all be treated as confidential in the sense that if it has to be pulled to bits no one will know that it is not his contribution after all. I do not think I ever reflect upon being a woman; but if I were the best man among you the task of editor of the journal of an Association like this is a very onerous one. I feel I have all the necessary enthusiasm and keenness, and, of course, I have twenty years of training behind me both in public health and in the broader kinds of authorship. Therefore it is not so much that I want your help in this. But I do want from you facts and living suggestions; and I would beg of you, who now represent many thousands of men, each to ask your men—the fitters, workmen, salesmen, accountants, every one of them—to give me points with regard to things that you think would be useful to put in the "Bulletin." They might write me short paragraphs, or even short articles. As I put in the editorial notices, articles will be paid for; but this is not the point. The point is I want the material. I am responsible for writing something in the leading articles; but I will not be responsible if the rest of the publication becomes dull, if I do not have your help. I have come into the work because I am keen on the question of public health. I have specialized in the science of housekeeping and public health, more particularly lately in lighting and heating, for the sake of the Association; and it is from this point of view that I am interested in the work we are doing. Do not think that I say it is better to be a professional man than a tradesman, because I have never been so proud of being one of a body of half professional men and half tradesmen as I have since I have been connected with the gas industry. I have said to my own sons that I shall be quite proud if they are all tradesmen, if at the same time they are all actuated by the same honourable feelings as members of the gas industry. I do feel one should look at it from a broader standpoint than the mere making of money, because if we look at it from that point of view only we are not going to do the best work. With regard to the heating of the home, the health of the wife and the prosperity of the husband depend greatly on how houses are constructed; and upon you engineering men lies the solving of the problem of the proper heating of the home. This is a very big question at the moment; but at the same time it will be all "in the air" if it is only going to be what professional men talk about. If no one comes forward and says: "This is a practical problem which we will solve," where are you? The doctors and the scientists may say we must have better ventilation; but it all comes down to the making and selling of the things. I am very proud of the work I have to do, but I cannot carry it on without your help; and I beg of you to feel that I am only held up, as one of the great Russian writers has said, ever upon the hands of the Association. [Applause.]

Mr. H. M. Thornton, J.P. (Richmond Gas Stove and Meter Company): Mr. President, I am very glad that our editress has got up and spoken her mind. As a member of the Executive Committee of the British Commercial Gas Association, we know that Mrs. Brereton has many problems to deal with; and I think it has done her good to tell you to-day of her difficulties, and ask for your help. I am very pleased indeed to be able to associate myself with the previous speakers in thanking Mr. Yates for his paper. As a manufacturer, I may say that we on our side are particularly glad that the choice of reading the paper has fallen upon one of ourselves. We regard it as a great honour; and we see from it the need for the co-operation of the gas makers and the manufacturers of the apparatus which provides the gas. While sitting here listening to the paper, I was looking back upon the day we had at the Institution meeting in Dublin. Through the kindness of the President, both Mr. Yates and myself were asked to say a few words with reference to a paper which was read. We then thought that the fusion of the two sides of the industry would have resulted, as it has done to-day, in a paper being read to this Association by one of ourselves. I am confident that, while we are proud of being in the position of joining you, you on your side are proud that we should do so; and I am quite certain that there is on neither side any spirit of feeling that one is better than the other. This being so, we start away with the determination in this Association to see that what we can do shall be for the good of all. I am extremely glad to be able to speak in the very highest terms of the paper that has been read, because I think it is well known that Mr. Yates, while being an opponent in business in one sense, is also a friend in business in another; and I am sure all my associates in the industry to which we belong are really proud to feel that we hold such a good place in your opinion and in the opinion of the gas industry generally.

The President here intimated that the discussions were open to visitors.

Mr. A. W. Oke: Mr. President, may I say just a few words from the point of view of a director of one of the smaller gas companies? We feel that there are very many difficulties in our way—one of the principal being that the public seem to have been captivated by the idea that the electric light is the light of the future. It is no use telling them that their sight will suffer, because they simply do not believe it. It is no use telling them that a room is hot from the electric light. We want them to see the facts. Let me appeal to our President—as I can do with confidence, now that he is a Doctor of Science—to see that we have fair play. I have seen it stated in the Daily Press that the atmosphere of one of the rooms in which a scientific meeting was held in London was very bad; but the account did not go on to give the real reason for it. They have not only blinded the eyes of the people, but have even made them blind to the fact that they are not using the light which would give them the best ventilation and preserve their eyesight, and thus cause the greatest happiness to the greatest number.

Mr. Leon Gaster (the Editor of the "Illuminating Engineer"): Mr. President, may I, as a visitor, say that I have very great pleasure in thanking Mr. Yates for the admirable paper he has read. We have not yet exhausted all the possibilities of gas. I am also glad to be able to bear testimony to the work done by the Chairman of the Executive Committee. I was very pleased to find that when we wanted to know something about high-pressure gas we had only to go to Mr. Goodenough to get all we required. One cannot help thinking of the poor consumer. He does not know whom to believe when he has read two sides of the question. It reminds me of the story of a soldier who came up to his sergeant and said: "I want to go home, as it is my wife's washing day." The sergeant replied: "I have had a letter from your wife saying there is no necessity for you to go home." To which the soldier replied: "Now, who do you think is the biggest liar, me or my wife?" The sergeant's answer was: "I do not know; I am not married." If the Association started in the spirit of finding out facts and figures to place before the consumer, this would be the right way to go to work.

Mr. S. Tagg (Preston): Mr. President, I wish to thank Mr. Yates for having placed before us so ably the advantages of advertising. I would venture to make a suggestion to the Executive Committee, and that is that it may be

possible for them to train, or to obtain already trained, men who would be available for provincial gas undertakings to canvass special sections of the community. This is an idea which really emanates from a paper which I understand will be read to-morrow, and which I do not desire to anticipate in any way with regard to the campaign among the doctors in the area of the Gaslight and Coke Company. Of course, very few of the Provincial companies have the resources of that Company. We have not the canvassers who could make the appeal which should be made, for instance, to the doctors; and it occurs to me that if in the future the Association could obtain the services of canvassers who would be available, on the payment of a small fee, to go into the district of any gas undertaking requiring his services, and undertake a short, sharp, and vigorous campaign, it would be very much more beneficial than possibly anything else would be.

Mr. H. KENDRICK (Stretford): I rise with some diffidence to follow the excellent speakers who have preceded me; but a sort of challenge has been thrown out for suggestions, and I have one to make. Mrs. Brereton made reference to the ventilation of houses; and other speakers have suggested that we should attack the scientific man. Now, it seems to me that this is the wrong end of the stick. The men we have to attack in the first instance in regard to ventilation will be the sanitary authorities or town councillors and our urban district councils. The rooms that are allowed to be built in the small cottage property of all our townships to-day are a scandal to a healthy nation. They are more or less like orange-boxes, with no ventilation whatever except what can get in through the crevices round the windows and under the doors. Even though we have to abandon the use of gas-fires for the heating of these rooms, in order to purify the atmosphere to a certain extent, we are at the same time reducing the amount of ventilation which the rooms are capable of receiving, by restricting the chimney area and the amount of air which passes through the rooms and goes up the chimney. If we could only impress upon the sanitary engineers and the authorities of the various towns the importance of altering their bye-laws a little, so as to insist upon providing a small ventilator, at the expense of only a few shillings, in every house, it would add very much to the health of the homes of a vast majority of the population. With regard to the paper itself, there is a great amount of matter in it which will bring conviction home to many people; but I think that Mr. Yates has omitted just one or two things. He has given four reasons why advertisements should succeed; but he omitted one, and it was that the advertisement should be really striking. The advertisements which have appeared during the past three months—in the Manchester district, at all events—especially on the subject of water heating, have been anything but striking. I have had a little personal experience of this. I wanted to bring home the question of water heating to a number of my friends, and I asked them if they had seen the advertisement. They said they had not. I showed it to them; and they said: "It is all very well; but we should never have seen it, had it not been pointed out to us." I think advertisements of this class require a little more direct point in them. Some of the illustrations are good, some indifferent, and some very much otherwise; and I consider that if there was a little more point in them they would carry a great deal more weight with the people. The same may be said, unfortunately, of the very successful and large pamphlets we receive showing the blocks which have been prepared for our use. I think there is too much sameness about them; and if they were whittled-down in number and had a little more variety, it would be a great deal better. I have one more suggestion to make, and it is this: There is a book which has appeared in the course of the last few weeks, entitled "Electricity for Everybody." There are a certain number of chapters in that book which, as pointed out in the "JOURNAL," would be of great advantage to us as gas engineers, and would give us an insight as to the way in which electricity is fitted in houses, the advantages claimed for it, and the manner in which it can be used. But there is another chapter which I think it would repay us all to read. As the "JOURNAL" has said, we may find it very amusing; but at the same time, if it is put into the hands of canvassers connected with electrical undertakings in this country, it is calculated to do us an immense amount of harm. Many speakers have emphasized the fact that we ought not to attack electricity. But I consider that, if electricity attacks us in the way that it has attacked us in this book, it is quite time to be up and doing. If there is any one of us who has a taste for collecting scientific facts relating to gas and gas apparatus of all kinds, I think there is room in the gas industry for a similar book; and I suggest that perhaps the Executive Committee might find a man who would produce it.

Mr. THOMAS GLOVER (Norwich): Sir, I should like to say a word or two somewhat different in tone from that of the last speaker. The advertisements which have appeared in the Press have attracted attention; and I have evidence of this from my own town. To quote one case, a certain Canon of Norwich Cathedral, whose name is well known to many of you, saw the advertisements in some of the papers in which the Association has advertised. He then wrote to the Association for particulars, and received a letter and a booklet. I also had a letter asking me to follow up the inquiry. This was done, and a good order for a water circulator was received to give a general supply of hot water. When the installation had been in use for a little time, the respected Canon wrote to me to ask what he had to pay for this luxury. The meter was thereupon read, and the quantity of gas consumed was calculated. He was so pleased that he immediately sent me his cheque and a letter of thanks for the attention he had received and for the luxury enjoyed of a good supply of hot water. This arose entirely from the advertisements of the Association. The Norwich gas undertaking has not been a non-enterprising one; for advertising has been done locally. It was started by my predecessor, Mr. Young; and it has been followed up and developed extensively in later years. All our local advertisements had escaped the Canon's notice; but an advertisement in "Punch," or some other paper, had caught his eye. This goes to confirm some of the statements made in the "Bulletin," and in the paper which Mr. Yates has read to us this morning; and I thought it would interest you to know that there was such a case. Of course, we have had other inquiries besides, some of them not proving so successful. But if we were to calculate the amount we have contributed to the Association on this one order, which may, of course, be the only substantial order we shall get this year, we might think we had paid rather a good price for the order. This would be so if it was calculated on the profit arising from the installation; but I would remind you that the gas consumption will go on for years. It is not the profit on the apparatus supplied, but on the gas, that we are looking to. Then, again, we do not know how much good has been done. I am sure that a great deal more good has been done by cultivating an "atmosphere" of public opinion than many of us know of. There is one other matter to which I should like to refer. Our editress has asked for points; therefore, perhaps I might suggest that it would be a good thing for the Association to have a register of qualified ladies, who are known to the officers of the Association, who would be good for visiting houses to advise on the use of cooking-stoves and other apparatus. Many of you may have experienced, as I have, that it is rather difficult to find quite the right sort of person to advise the users of cooking-stoves in all kinds of houses. If a lady visiting a house is not very tactful and skilful, she does more harm than good; and I think it would be a capital thing for the Association to have a register of ladies who could be supplied to undertakings for (say) three or six months occasionally, so as to see how the stoves are being used, and so forth. We are fixing a great many cookers, and very often the engineer or the responsible officer has many an anxious moment wondering how these stoves are being used. He goes through his rentals occasionally, and is disappointed to find what a small consumption results from the use of some stoves. If the consumer could be advised as to a better employment of the oven particularly, I think good results would accrue.

Mr. H. E. BLOOR (Carlisle): Mr. President and gentlemen, I stand before you to-day as a visitor to the British Commercial Gas Association; and I do so with a very keen sense of shame. I believe that this Association, by the work it is going to do, will inevitably add many years—possibly generations—to the life of the gas industry; and I feel sure that the vast majority of gas engineers to-day who are not members will feel as ashamed as I do to stand before you merely as a visitor. We ought all to be here as members of the Association working for the good of the entire profession. Even those of us who are in favour of the Association, and have endeavoured to get our respective committees or directorates to join it, stand before you condemned to some extent even by the very fact that they have

not been able to obtain the adherence of their boards. I do hope that all gas engineers will feel it is a blot on their escutcheon that they are not members of the Association. I regret to say, with regard to my own undertaking, that the chance of its coming in is about as hopeless at the present moment as one can imagine. I should like to suggest one outlet for the energies of the editor and staff of the Association which has not been mentioned. The reader of the paper premised as a sort of axiom that it would be unnecessary to recommend the municipal authorities to cheapen their gas. I have no hesitation in saying that he is wrong in assuming that municipal administrators of gas are impressed with the necessity of cheapening their product to the public. It is emphatically not so where I am employed. I do not know to what extent it is so in the rest of the country; but there is undoubtedly a school of thought which considers that gas is rightly doomed to extinction, and that it is not only necessary, but desirable, that its extended use should be discontinued. I think if there is any section of the community which desires more specialized attention than others it is the municipal councillors in various parts of this country. This is an age of science, and the latest scientific craze has the best hearing. We are emphatically condemned by large numbers, as supplying an old-fashioned and unscientific commodity. I do think this view is going to be fatal to the gas industry, unless we can convince people that they are wrong in this respect, and show them, on the other hand, that gas represents a real scientific agent which is for the benefit of the community. The right way to do this is to preach, in season and out of season, that gas authorities should share their prosperity with their customers. Our profits from our residuals are soaring up to great heights. Our coal is really costing us nothing. [Laughter.] I say this quite sincerely, because I believe every gentleman here will recoup the increased cost of his coal by the increased value of his residuals. Now I say that this condition of affairs cannot continue, and when this has vanished we shall still be left with the legacy of dear coal; and the only way in which we can possibly safeguard our profits when the inevitable slump in the residuals comes, is by an increased turnover of our business. This is a view which I have endeavoured to put before my own department, but with no success so far. I should like to say, in conclusion, that there is one aspect of the value of the Association which has not yet been mentioned in the discussion, and it is that the Association will fulfil, in the business and sales department of our work, the purposes which technical associations fulfil on the technical side. That is to say, if we all stood alone, and there were no Institution of Gas Engineers, if each individual gas engineer evolved a process which marked a distinct advance without the Institution, and without the Technical Press which so ably seconds the efforts of the Institution, that invention would require some time before it became current knowledge. At present there is no industry in which fresh knowledge becomes current property so quickly as in the gas industry. The Association will result in gas engineers being kept strung-up to the truth of the necessity of selling gas. They will learn, without knowing how they are learning, the best methods to adopt and the necessity for adopting them; and I believe that the influence of the Association will in no other respect be more important than in the effect it will have on the minds of gas engineers, managers, and directors, and I trust ultimately, gas committees.

Mr. John Young (Hull): Sir, like others, I feel grateful to Mr. Yates for the useful way in which he has re-stated the aims and objects of the Association, and also for the earnest and eloquent appeal he has made to those gas undertakings which have not yet cast in their lot with us. Like many an excellent sermon, I think Mr. Yates's paper is rather intended for the absentees than for those who are present; and it is sincerely to be hoped that those for whom it was written will see it, and "mark, learn, and inwardly digest" it, and I hope, as a result, give some outward sign that they appreciate it. My friend Mr. Glover has referred in a very kind way to my earlier efforts. I claim that the gas industry generally has felt the influence of the advertising done by the Association, for in what other way can we account for the phenomenal increases which are taking place in gas consumption all over the country? In my own case, there has been as much as 12 per cent. advance on the last quarter, and this was not on a preceding bad year. The increases we have had have been on the very best year that the gas industry has ever known. While there has been an increase in the consumption, there have been decreases in quite a large number of departments. The cost of production in the bulk has decreased by every increase in consumption. Salaries, rates and taxes, wear and tear, cost of distribution, and general charges, even the amount it takes to pay the dividend each time, will be slightly reduced by the greater consumption of gas. In these days, in spite of what my friend Mr. Bloor says, when we have enhanced prices of raw material and increases in rates and wages, do you not think that the gas consumer would be glad to know that there is something being done at least to prevent an increase in the price of gas? I, for my part, think so. The President, in his address, referred to the consumer ultimately paying for the advertising. No doubt in most places the gas consumer pays for what we are doing; but he will ultimately profit by it. The average gas consumption per consumer is some 30,000 cubic feet per annum. What are we asking from him? Only 1d. a year. If the advantages which we claim will result from the Association could be laid before the consumer, do you think for one moment he would grudge the 1d. per annum to gain these advantages? I say most emphatically "No." Therefore I cannot understand why people should hesitate to join the Association, which will inevitably increase their output and decrease the cost to the community, because only by selling gas at the lowest possible price to every consumer can we obtain a legitimate permanent success.

Mr. H. Townsend (Wakefield): Mr. President, it has already been pointed out in the excellent address that you delivered this morning, and also in the paper we have just heard read, that what we want particularly to do is to gain the support of those who are holding aloof. I thought it might be of assistance if I again drew the attention of the members present to some statistics I had the privilege of laying before the Institution of Gas Engineers last June. As you will perhaps remember, I was fortunate in being entrusted with a great number of statistics from undertakings in Lancashire and Yorkshire with regard to the day-load, and also with statistics as to advertising. I found, upon examining the statistics, that the undertakings which advertised largely had a consumption of gas per head of the population in Lancashire of more than 300 per cent. over the undertakings at the bottom of the list which did not advertise, and in Yorkshire even a greater proportion than this. I can easily understand that in the case of a poor undertaking the expense of advertising naturally goes against the ideas of prudence. But the point must be borne in mind that any undertaking which advertises will have a good go-ahead policy in all other respects, and that then one thing reacts on another, and other methods of advertising crop up, and it all redounds to the benefit of the undertaking and enables it easily to support the increased cost brought about by the advertising and all other methods of pushing business. In other undertakings it is not fair to say that advertising was the only cause of the difference in the consumption per head of the population. It was one of the causes, and this and others led to the prosperity of certain of the undertakings—causing them to come out at the top of the list, and those at the bottom to have such a very poor return per head. I am glad to bear witness to the remarks made by Mr. Glover as to the advantages of the work of the Association. About three weeks ago, a communication was sent to me from the Association, stating that one of my consumers had applied for particulars through seeing an advertisement; and on following up this inquiry, I, like Mr. Glover, was able to secure a good consumer. Stating these points will, I hope, cause those who have not hitherto joined in this movement to see the advantages to be derived from becoming members of the Association.

Mr. S. R. Barrett (Birmingham): Mr. President, there is one direction in which it seems to me that the scope of this Association might be widened—that is in the direction of educating the men who fix the apparatus for gas consumption. We have felt the impetus which has been given to the distribution section of the industry by the work done by the Association. It is within my recollection that the manufacturers who supply the apparatus to the gas undertakings have in past years, and even at the present time, not been able to keep up with the orders through the increased demand made on them by gas companies. This has latterly been somewhat overcome. But another trouble has arisen, in connection with the fixing of the apparatus which has been sold by the thoroughly educated commercial men, by the good advertisements, and by the skilful way

in which gas companies now bring their wares before the public. This trouble has been largely brought about by the inability of the men to fix the apparatus. It seems to me that this Association would do inestimable good to the whole industry if it were to cause the old system of apprenticeship to be revived, so that young men might learn the science and art of the business. It appears to me that the final distribution to the consumer has been looked upon as an unscientific business. In my opinion, we must educate the men who come finally in touch with the consumer, and teach them in the same way as we teach our commercial representatives. They must leave the apparatus in a proper way; and when we have that type of man educated, we should not require so many inspectors. By the free introduction of apprenticeship in the business, we should get a spirit of emulation and self-management, and a type of men who seem to have been somewhat in the background.

Mr. Douglas Helps (Reading): Sir, it was not my intention to speak at this meeting; but the remarks which have been made by Mr. Kendrick and Mr. Glover remind me of this—that the value of the work of the Association should not be judged merely by the number of new consumers who are obtained or the amount of apparatus that is fixed in consequence. There is another value attaching to its work which it is much more difficult to determine, and that is that but for the work of the Association we should probably lose a large number of our customers. I would at this stage urge all those undertakings who have not joined to do so at once. I am quite aware that a number of directors of undertakings, when they are asked to join the Association, say: "We have been paying full dividends for the last fifty years. Leave well alone." To those I would merely reply that the policy of leaving well alone has probably driven more businesses into the Bankruptcy Court than anything else.

Mr. J. H. Hill (York): Sir, there is one direction in which I think the Association might help us very much. I was talking to a lady when I was on my holidays recently, and I remarked to her that, in my opinion, gas was helping ventilation very greatly. She said: "Why, you must be a gas manager." I replied: "That is what I am." She then said: "There is a gentleman who comes and talks just like that; but he is not a gas manager, he is a director." I said: "He was telling you the truth." She said: "Yes; you are trying to push your wares, and it is your business to do so. But then he was only a director; he ought not to speak like that." So, when we can say to customers: "What I am telling you is what Mr. Corbet Woodall says," then we have the Committee behind us, and we can bring home the truth to them. No doubt the Association could do a great deal of good in making it evident that we enthusiasts are not on this account simply faddists who have something to impose on the people.

Mr. W. M'I. Valon (Stafford): Mr. President, I should much like to say a few words, really more from the point that I am in rather the unique position of being in charge of an electricity undertaking, and at the same time a member of the Association. I want to bring before you the tremendous difficulty that I had in getting my Committee to join the Association; the difficulty being that they were so frightened that if the Association should prove a success it would snuff out the electric light undertakings. The point I should like to bring forward is that, in my opinion, it would be a great help to a large number of municipal gas engineers if a short article could be put in the "Bulletin" principally pointing out forcibly that the Association was not formed for the purpose of hurting electricity, that it was purely for the good of the gas industry, and that whatever happens it would be only doing good to that industry and would not hurt electricity in any form. If this could be stated, so that municipal engineers could send the "Bulletin" round to their committeemen, I am sure that it would help them in their argument, because it would have more authority than one poor man who is fighting a very uphill fight.

Mr. R. S. Hilton (Birmingham): Sir, may I take up a minute of your time? As representing one who has had considerable help from the Association, I think it is only right that personally I should acknowledge the assistance which I have received, to the great advantage of my Corporation, since the Association has been in existence. Referring to the remarks in Mr. Yates's admirable paper with regard to permanent advertising, as one who has tried what Mr. Yates puts forward, I can speak from personal experience; and I am thankful to say, from the fact of my Corporation continuing advertising—not depending entirely on the Association, but doing more of our own local advertising—we have, since the formation of the Association, been, and are up to the present day, inundated with more orders than we can comfortably execute. I believe that we were one of the first to send up our cheque; and I, as an amateur, approached the Association at once. I sent up the same day various little points; and I must acknowledge that I received shocks, not from electricity, but from the prompt attention which I received—almost before I thought it was possible for a letter to come by return of post. I had the most valuable information and instruction that I could wish for; and on more than one occasion I have simply swept the room against the opposition party—not that I have attacked them, but I have acted in my own defence, using the information supplied to me by the Association. As I said just now, I can confirm Mr. Yates's point in reference to the necessity for the continuance of permanent advertising. We not only put advertisements in local papers, magazines, programmes, and all sorts of things three or four times or twenty-five times, but we continue from the beginning of the year to the end. And this has resulted, as I said just now, in a very large increase of consumption. Without the assistance we have received from the Association, I am quite sure that the increase in our consumption would be under 25 per cent. of what it has been. Referring to the temporary engagement of a canvasser, personally I should be only too glad if I could give an order for a canvasser; but I know it is not to be expected that I could engage a good canvasser to come to me as a temporary hand. If, however, we could obtain a canvasser through the Association, I should be only too pleased to avail myself of the privilege; and I am quite sure it would be of great advantage to our Corporation.

Mr. Alex. Wilson (Glasgow): Mr. President, I would like to thank Mr. Yates for the appeal he has made in his paper. I am sure the suggestions he has put forward, if used in a judicious and careful way, will bear fruit for the members of the Association hereafter. With reference to attacking the electricity department, and all that, I think it should be very carefully considered. I am in charge of an undertaking where we have a very large electricity department, and a very successful one; and I have never found the slightest friction. If the advertising is well done—and if it is done in the future by the Association, it is bound to be well done—it will bear good fruit. But we must not forget that, in addition to advertising, we must follow up things in a practical way. You may talk to a man for a very long time about the benefits of gas, but if he has the idea that gas is not hygienic, that he should not have it in his house, you will get no good whatever from all the talking or advertising in the world. You want to say to that man: "Let us put a gas-fire in your house, and you test it for yourself. If you do not like it, we will take it away again." Of course, you run the risk of some outlay; but I have never found a gas-fire come back again. I think that, while we are trying to get the adults and the older people to go in more for our methods of using gas, we should start earlier—we should start with the schools. We have given the School Boards every assistance in the way of cookers at the present time; and we have competitions in cooking among the scholars. I think we have something like 500 competitors coming forward, who are going in for small prizes and certificates. The result of it all is that we are making future gas consumers of all these young folks; and I am sure that will bear good fruit.

The President: I think, gentlemen, we can congratulate ourselves upon the first discussion that we have had upon a paper in our new Society. I will not attempt to add to it, or to deal with the points that have been raised this morning, because I am anxious that we should not prolong our meeting too much. Therefore, I will put to you the resolution that our thanks be accorded to the reader of the paper for his contribution.

The resolution having been carried with loud applause,

Mr. Yates said: Mr. President and gentlemen, I am deeply grateful to you for the interest you have taken in my paper; and I feel that any small time that I have expended in writing and putting my thoughts together has been amply repaid.

The conference then adjourned for luncheon.

Wednesday, October 9.

The chair was taken punctually at 10 o'clock by the

President, Mr. Corbet Woodall; the Mayor of Salford being present at the commencement of the proceedings.

The first paper read was entitled

SHOWROOMS IN RELATION TO GAS SUPPLY.

By GEORGE CLARRY, of Cardiff.

Recently, at a scientific conference, the apparently obvious question was raised, "What is life?" An inquiry is now put to you, at this meeting of experts in gas matters, "What is a Showroom?" Must our answer be, "The odd corner in an overcrowded office?" "A corridor stocked with cookers?" "An old store room converted, looking very untidy and generally neglected?" These are conditions which perhaps at one time were allowed to exist. Happily, in this age of progress, retrograde or makeshift showrooms are rarely, if ever, seen. There are, however, in many places, opportunities for improvements of a far-reaching character.

This point will no doubt be freely conceded when it is realized that the showroom of to-day, as an auxiliary to the manufacture of gas, is deserving of our first consideration. Primarily, the showrcom is intended for the convenience and benefit of gas consumers, whose interests it is our duty and pleasure to serve. If these essentials are admitted, then the object of a showroom is to display goods pleasing to the eye, useful, attractive, and artistic. Anything short of these conditions, implies neglect of present opportunities, which will reflect sooner or later on the undertaking itself.

If you consider the great business houses in London, Manchester, and other important centres, you will find that their progressive and educational methods are worthy of careful study. Their showrooms are luxurious beyond description, while the counters and showcases are stocked with tempting goods, and form a liberal education in the art of displaying just what you never expected to want, but which, thanks to their energetic suggestions, you now find are absolutely indispensable to your well-being.

In our profession, suffering as so many concerns do from a plethora of prosperity, the need for pushing business does not appear to arise. This is a comforting doctrine, but somewhat elusive. The right to retain prosperity is only conceded to those who work for its continuance. Conditions alter, and the successful firm is the one that adapts itself to meet constant changes.

Greater developments have taken place in the method of using gas than probably in any other industry, owing to the general adoption of the incandescent mantle as a means of lighting. Of course, the manager whose output of gas year by year steadily increases without special sale room attractions, or whose time is fully taken up with multifarious duties in or about his works, feels that the energy to establish and maintain at a high pitch of excellence a first-class showroom requires more effort than he can be reasonably expected to give. Under such circumstances, the sales business is conducted in a half-hearted way; and the showroom stock is dumped down in any odd place, while the entire affair is perhaps regarded by the chief and his hard-working staff as a necessary nuisance, and treated accordingly.

Perhaps, however, the works are unfavourably situated, or the offices congested, so that no showroom at all is provided, and nothing is done for the consumers beyond giving a supply of gas. In such cases, the public is left to make its own choice of fittings or stoves, and no encouragement is given to adopt new and improved designs. Thus, great inequality of treatment prevails. We want greater uniformity of practice, and full attention paid to the wishes of consumers everywhere.

Educational.

Few managers will admit that gas consumers do not require educational treatment, as much as in any other scientific and complex business. The paper to follow this morning, upon the education of doctors, emphasizes this point very conclusively. The strength of our industry lies in the numberless uses to which gas can be put. Contrary to some industries, which rely principally for their continued success upon a prevailing fashion, the uses of gas afford such infinite variety, and are bound up with so many phases of modern industrial and domestic life, that however assailed by formidable foes, there is always scope in one direction or another for some further expansion and progress. By "formidable foe," you will understand what is meant. The illustration of methods adopted by our opponents will, I am sure, appeal to you.

Thanks to the foresight and enterprise of the stove and lamp makers, our showrooms can be stocked with scientifically constructed appliances, specially suited to the wants of all classes of consumers, who thus secure for their outlay the greatest possible efficiency in light or heat. It may be urged that having such perfection of detail in construction, everybody knows all about gas-burners, and the best way to use them. Will anyone come forward and show that the public does not require practical instruction? With much respect, the writer ventures to assert that where no educational facilities are afforded (by which he means a well-stocked showroom and a specially trained staff), the gas is likely to be improperly used—that is, crude and wasteful methods are employed, to the obvious disadvantage of all parties. The remark of one who had persistently neglected his district work, may serve as the awful example. Said he, "I was quite horrified to find that we had lost so much ground." This phrase may be somewhat cryptic; but you, as experts engaged in keen competition, will readily understand my meaning.

On the principle that an ounce of practice is worth a pound of theory, an experience for which the writer can vouch may be submitted for consideration. The gas company with which I have the honour to be associated have carried on a fittings business at their principal offices for over half-a-century, and, in proportion to the growth of the district, have experienced the usual increase of business in the department. The old showrooms, however, being somewhat outside the best shopping area, the directors determined to establish an entirely new branch in Queen Street, Cardiff, which may be described as the "hub" of the city; and these premises were opened in April, 1910, fully equipped and provided with a stock-in-trade.

Our Technical Press* having published a description of this branch, it will not be necessary to trouble you with elaborate details at this juncture.

Equipment.

Naturally, however, the question will be asked, What sort of showroom did you fit up? This can be answered as briefly as possible. The accompanying photographic reproductions will perhaps convey some slight idea of the internal arrangements, which require no further description. It may, however, be pointed out that an effort has been made to avoid overstocking of goods, which are changed periodically. Consumers have, therefore, more opportunity to move about and examine the various fittings on view, while the latter are displayed to greater advantage.

As regards the fittings, it is, I think, important to note that, wherever practicable, the pendants (also brackets) are fixed and connected up to the gas supply pipes, and provided with switch lighters. The heating stoves are also connected to the fire-places, and during the season give a practical illustration of their capabilities. Water and gas are also laid on to the bath and geyser; consequently, prospective customers can see the practical effect of this arrangement. A hot-water circulating system is provided and kept in full working order.

Ventilation.

The question of ventilation in a large room of this character is one demanding attention. The method adopted is to draw the air from front to back by means of an electric fan, driven from a small gas-engine and dynamo, fixed in the basement. This gas-engine is arranged as an "exhibit," and has been the means of attracting business.

Window Displays.

We find that a regular succession of attractive windows of original and striking design will grow to be a subject of interest and remark with the public. It is important that the window should be dressed according to season; and there is no limit to the exercise of ingenuity and taste. The use of plants is particularly recommended. A special arrangement, by which the front window was set out as a dining-room—having the table decorated with fresh-cut flowers and fruit—proved an effective advertisement. Incidentally, it was somewhat costly; but the expense was fully justified by the amount of interest it aroused. For winter evenings, an illuminated flashing device, or a lantern screen exhibit, with special subjects, proves an effective display. The adoption

* See "Journal," Vol. CX., p. 433.

Exterior of the Cardiff Gas Company's Queen Street Show-Room.

of special window and inside displays, suited to particular trades in the district, is worthy of attention.

STAFF.

Reference has been made to the difficulty which a gas manager may experience in carrying on the work of a show-room with a staff fully occupied by their ordinary duties. Frankly, no official should be placed in such a position, or expected to perform this very exacting duty under such conditions; for it must not be forgotten that considerable additional work will follow the opening of new premises, involving much office and outside attention. To carry on these extra duties, a specially appointed officer of good organizing capacity is required, with an experienced inside staff, who will make the wishes of consumers their particular study. Let those few people who wish to run their show-room department cheaply take the well-known advice and "Don't."

Speaking of "Don'ts," if I had to write a list, undoubtedly the following would have due prominence:—

1. Don't understaff!
2. Don't overcrowd your goods!
3. Don't display dead-stock!

The Cardiff Gas Company's Show-Room.

Another View of the Fitted Stoves, Pendants, &c.

Outside Lighting.

Next to the window display, the feature that attracts the greatest notice and comment is the outside lighting of the showroom. The premises illustrated here are lighted outside by means of eight 1500-candle power suspension lamps, supplied from our high-pressure gas-mains. This lighting formed the nucleus, and was the pioneer of what has proved to be a very successful high-pressure lighting system in Cardiff.

Want of space compels me to deal very briefly with one or two other points in the equipment.

Cashier's Counter.

This is placed at the back of the showroom, where accounts for all districts are payable. Thus the counter forms a ready means of bringing consumers inside. In the first period of eleven months after the opening, over 12,000 accounts were received; in the second (a full year), over 16,000 accounts.

Show-Room of a Small Country *Gas* Company.

Hire-Purchase.

A large proportion of the goods sold is on the easy payment system, which, in addition to heating and cooking stoves and radiators, is extended to lamps, hot-water circulators, boilers, geysers, and certain fittings.

Bookkeeping.

Proper stores accounts are kept; and the list of articles in stock is constantly revised. A daily record of sales is made, and the usual issue books provided. Consequently, a rough balance of the business transacted can be struck at any period. Orders taken at the branch are executed from the works stores.

Cookery Demonstrations.

As part of the branch, a small lecture or class room is provided, where periodical demonstrations of high-class and artizan cookery are given. Special courses of instruction have also been given.

Testing Room.

Before being placed in the showroom, heating stoves, lamps, and lighting burners of new design are carefully tested and adjusted to local conditions. This room, which reproduces all the conditions of an ordinary house, is fitted up with check meter, thermometers, and suitable scientific instruments.

Does it Pay?

This question is anxiously put by those who are called upon to provide the needful for any new development in the sales department of their gas undertaking. Naturally, every official wishes to give his board or committee an answer in the affirmative. The reason for this very laudable desire is due to the spirit of commercialism which controls the destinies of business life. A nation of shopkeepers cannot tolerate the shop that does not pay. Must we, as gas suppliers, also take this exclusive view of our subject, and condemn showrooms as undesirable, unless they can be shown to yield a profit? I think not. Commercialism of this character is good in its way, but on this particular question is not everything.

Results.

The following brief summary of business done solely at the new branch may interest you. It will be observed that a gross profit of about 20 per cent. on the turnover was made, and a surplus balance was left after all charges had been met:—

	To March 31, 1911. Eleven Months.	To March 31, 1912. One Year.
Stock	£645 0 0	£787 0 0
Total sales	3,373 0 0	4,405 0 0
Gross profit	674 0 0	881 0 0
Less charges	575 0 0	592 0 0
Surplus	99 0 0	289 0 0

It is interesting to record that, notwithstanding the sales effected at the new branch, the returns at the old showrooms were not affected in the slightest degree. Hence it can positively be asserted that the opening of these premises gave considerable impetus to the demand for gas throughout the district. From the above brief record, you will easily understand that this new venture caught-on—in fact, at times we were overcrowded with callers.

Having submitted what may be considered the direct gain, let us for a moment turn to the indirect benefit which this impetus provided. Excluding burner consumption for lighting, we will take the stoves sent out from Queen Street during these two years. Altogether, nearly 3000 stoves, circulators, and similar appliances were sold and fixed in the Company's district from orders that were received at Queen Street alone. Taking a moderate estimate, founded upon actual experience in this district, the quantity of gas which these appliances would consume works out at about 30 million cubic feet per annum—all day load; and this increased business being progressive, it follows that, apart from the result of sales, the advantage gained by the inauguration of this branch, is very substantial.

In case it may be urged that novelty accounted for the large returns during the first two years, there is no falling off so far in the current year's takings, which up to date show a satisfactory increase on last year's results. For your guidance, I will submit a table showing the quantity of gas sold, &c., during the past few years, with the percentage increases.

Year.	Estimated Population Supplied.	No. of Consumers.	No. of Stoves. All Classes.	Gas Sold in Thousands. Private Consumption.	Increase for Year. Thousands.	Percentage Increase.
1909	225,000	32,500	24,744	1,063,799	21,082	2·02
1910	228,000	34,297	27,553	1,091,634	27,835	2·61
1911	230,000	35,720	30,325	1,157,330	65,896	6·02
1912 (Half-year)	231,000	36,612	31,758	600,236	32,556	5·73

You will not fail to notice the increased percentage commencing with the year 1910.

A Forecast.

Clearly, we cannot stand still while progress in allied industries is taking place around us. Disregarding the old advice of "Never prophesy unless you know," I venture to forecast the showroom of the future. That there will be improvements on the existing types, goes without saying. Instead of miscellaneous goods being collected together in one place, suites of rooms, each tastefully decorated and furnished, will contain just those gas fittings and fires which, from an artistic and hygienic point of view, are the best adapted to that apartment. Model kitchens, even workshop apparatus, will be displayed under proper working conditions; for the gas showroom will be extensive, and form a pleasing and striking feature in each town. No gas undertaking will be considered complete without a specially arranged building set apart for the sales department, where the inquiring or prospective consumer may find everything that is best for his requirements in light, heat, and power.

The only exception possible might be the very small gas-works. Here it gives me an opportunity of directing your attention to the photographic copy of an actual showroom in a country district, supplying about 500 consumers, with an output of 7 million cubic feet per annum, which shows what can be done in a small way. Should it be found impossible to set up even the unpretentious showroom here illustrated, a number of small works might combine to establish a central premises in the nearest market town. Every showroom would be fully equipped with the latest and best appliances, all of which are to be at the disposal of consumers upon terms which would be either gratuitous or quite nominal. Expert instructors would be employed in teaching, free of charge, prospective consumers the way to use new appliances and apparatus. Demonstrations to be given by competent lecturers on current subjects of interest to gas consumers. Moving picture displays to appear both in the windows and lecture room. Lastly, the entire lighting and heating of every consumer's premises would be taken in hand from the gas-works, free of all maintenance charges.

Conclusion.

The title of this paper permits of wide descriptions, all of which cannot be entered upon here. But there is one class of what, with courtesy, may be designated as a showroom to which reference should be made—viz., the well-lighted and efficiently heated premises of a satisfied gas consumer. Such an installation forms not only an effective advertisement, but is undoubtedly the best evidence afforded of the gas supplier's skill, enterprise, and good management.

Discussion.

The President: Gentlemen, as we have three hours in which to deal with three papers, I am going to ask you to give an hour to each. There is half-an-hour left for the discussion of Mr. Clarry's paper; and I hope we shall make full use of the time. The discussion is now open.

Mr. W. N. Westlake (Exeter): Mr. President, I have much pleasure in rising to propose a vote of thanks to Mr. Clarry for his very interesting and instructive paper, which is illustrative of the force of character which characterizes all that he undertakes. I do not wish to occupy much of your time; but still there are just two points that I should like to develop which he had already mentioned, and another point that I should like to enlarge upon in fulfilment of a promise which I made yesterday. Mr. Clarry asks, "Does it pay me?" I would give my experience at Exeter, and will ask you to bear in mind that that city does not grow very rapidly, for in the last ten years the population has only increased by somewhere about 6 or 7 per cent. In the year 1899, we had a decrease in the sale of gas; but from

the year 1900 right up to last year our consumption has increased nearly 50 per cent. Mr. Clarry mentioned the question of the staff of the show-room, and he expressed the opinion that it should be a separate staff, with which I quite agree. I should like to develop that point, and go just a step further. It should be a technically qualified staff. I will give you a little incident that occurred a few months ago. We have a large private asylum in the area of our supply, to which we have for many years past given a supply of gas. Recently they have made extensions, and quite unexpectedly two of the doctors and the consulting architect called at our show-room, which they thought was the natural place to go to for information; and I am glad to be able to say that I had a technically qualified assistant on the spot to meet them. He was able to give them all the information that they required. Among other things they asked about was the comparative cost of high-pressure gas and electric lighting. I myself saw the architect a few weeks afterwards; but in the meantime a representative of the Lunacy Commissioners—an Inspector—had visited the asylum, and had discussed the matter of lighting with them. It may interest you to know that the Inspector thoroughly endorsed the recommendation of the architect and the doctors of the asylum when they said they thought that an installation of high-pressure gas would be the most up-to-date method of illuminating the premises. Since then the advice has been followed, the pipes have been put in, and I think in the future a high-pressure system will be at work there. My point is that if I had not had a technically trained assistant in the show-room, it is quite possible that the deputation would have gone away dissatisfied. Now as to my one point of criticism. Mr. Clarry, touching upon the question of ventilation, mentioned that he had installed an electric fan in the show-room. Why an electric fan? The most appropriate place for that would be in an electric show-room. I think it would have been much better if they could have seen their way to use gas for the purpose. With these remarks, I have much pleasure in proposing a very hearty vote of thanks to Mr. Clarry for his paper.

Mr. John West (Southport): Mr. President and gentlemen, I beg to second the vote of thanks to Mr. Clarry. I was never more delighted in my life than when listening to his admirable paper. I take a great interest in this matter; and I am glad to find that the Cardiff Gas Company were wise in their day and generation. They began to insure themselves early, so that they have had a long existence, and are now reaping the effect of their early insurance. I look upon the paper as one of the most important papers that we could have before us. I am an old bird, and perhaps you may imagine that I was brought up in a slow crew; but make no mistake, that was not so. I was a fortunate young man in my time; and I happened to drop down into a place where they were pioneers in this sort of thing. I do not want to appear too old; but 60 years ago I commenced to learn my business, and I went to a gas-works where they had one of the finest show-rooms at that time—it would eclipse most of the show-rooms of the present day. At the Northampton Gas-Works they made gas-stoves; and they made all the appliances in connection with cooking and heating, because there was no one else to do it for them. There were no manufacturers in those days. We made a good article, and we used to sell cheap. One of the ideas we had was the education of the people. It was not only a monopoly in that town of making gas, but the monopoly consisted in the full control right up to the burner; and in every case where this takes place the benefit to the consumer is very great, because they can do the work so well and so cheaply—much cheaper than you get it done by the ordinary plumber. Wherever the gas industry has taken up the duty of fitting, it has always done them much good. They have increased the consumption in every direction; and, of course, to do that they must have well-trained officials. First of all, I would say educate yourselves, so that you can educate others. Now this course went on, and I thought at the time that the same thing was being done in all gas undertakings; but I found afterwards that such was not the case. After being there fifteen years, I left and went to Maidstone, where I found there had been some pioneer work carried out by Mr. Somerville, who preceded me. Cooking-stoves were being made there. I looked the matter up as far as I possibly could; and whenever I had the chance, I got to the consumer and offered to give him little hints showing how he could save money if he would only use the best burners. What was the result of all this? I used to get among the doctors and explain to them what could be done, and what could not be done. The result was that every doctor in Maidstone had a gas-fire in his house—every individual doctor. My own doctor burned no coal at all in his house; he had a gas-fire in every room. That was the result of education. This is the one thing that you want to bring to bear on this subject. I do not think any corporate body or gas company are doing their duty to themselves or to their consumers unless they take the control of everything, and educate their people to use that which they make in a proper manner. That is the way I was brought up, and you can easily understand that I think it is the proper thing for your people to advance the interests of the gas consumption in every possible way you can. The President told you that gas making was a monopoly. Now I always took that seriously, and contended that we had some obligations to our directors and to the consumers, and that we must do our duty all-round for the benefit of all concerned. You will find if you undertake to do this, you will be advancing the interests of the gas concern in every town and place where you dwell. Now speaking of this wonderful Commercial Gas Association—this great "mixing-up" that has come about—I want those of you who have not thought about it seriously enough to put your hands down in order to come in at once. We want money to carry on this great work. We have already been told by our friend Mr. Goodenough that to carry on this great work we must have help. The men who are working for us are not paid officials. They have their own duties to perform, and they are putting in this extra work for you and me and everyone else; but they want encouragement. First of all, I would appeal to those who have not subscribed to send in their subscriptions to-morrow. Do not let it run the week out. You see what Manchester has done in giving the lead. Then follow suit. Not a word as regards the Society of British Gas Industries. I call them brethren also. I used to belong to the first, now I belong to the second, and now we are all mixed together. I want to tell them that a great exhibition is coming along; and during this coming Jubilee year we want to rejoice the heart of our President. They have given us such a lead in Manchester and Salford that we of the gas industry have to do a lot more. We have to put our hands down for this exhibition; so get your cheques ready, and do not be behind hand in sending them. Young men who are working heart and soul in this business want help. They do not want much guidance. I could trust myself in their hands, and my money also, because I know they will spend it well. I have made up my mind to put something down; and I am going to speak to all the commercial men in this district, because it will be good for you. Do not begin to ask what it will do for us. Why, it will do good to everybody. If these engineers get the gas supply increased, will they not want more apparatus? Of course they will. This is no philosophical association. I am talking business; we want to extend the use of our gas. Look at Glasgow for example. Consider what they are doing. Toe the line with them, and then you will find that at the great Jubilee (and I hope I shall be there) we shall have as grand a show as has ever been seen. You manufacturers have to sink your individuality. We are going to have an exhibition not of competitive traders—none of that; the day of that is past. There is to be something better and grander than there has ever been before. Work yourselves up to "concert pitch," and then we shall have a glorious Jubilee, and please the heart of our good President

Mr. T. Canning (Newport): Mr. President, I should like very much to add my small tribute of praise to the excellent paper Mr. Clarry has read. The only fault, as a friend, that I can find with it at all is that he has not quite done himself justice. He has a very admirable show-room at Cardiff, splendidly equipped; and I think he has every reason to be satisfied with the fine results he has obtained. I might mention that we have a similar establishment at Newport run on very much the same lines. I do not suppose there are many people now who still think you can keep your show-room at the central office, or in some out-of-the-way place. In my opinion, if you do you might just as well have no show-room at all. For all the good it would do, it might as well be at the bottom of your deepest gasholder tank. There are certain points in the paper that I should like to offer a few short observations upon. In the first place, I do not think that the whole of the increase in the

output of gas can quite be attributed to the show-room, though, nevertheless, it is a very powerful factor. The increase is aided, as we know, by many other things; and a show-room is only one out of a number of combining forces which go together to day to make up what I hope will be a great and prosperous future for our business. With regard to the question of ventilating the show-room, I should have thought that this could have been brought about without the use of an electric fan; and I think it would be an admirable thing if some of the gas people were to exhibit the advantages derived from the use of gas in promoting ventilation. One very admirable thing that I have seen done, and at the same time it is a very important thing, is to show plants—not cut flowers, but living plants—in the window where gas is burning. I am aware that in past days a vast deal of nonsense has been talked about the deleterious effect of gas upon plants. If it could be demonstrated in a show-room that it has no such deleterious effect, I think it would be a very great point gained. I noticed also that Mr. Clarry has a testing-room; and this is a very admirable thing to have. He tests the cookers, fires, and so on, there; and there is no question at all with regard to cookers and gas-fires that, notwithstanding a great deal remains to be done for both of them, vast improvement has been made. I should like on my own account to say something which I hope will not give offence to anyone. It is that I do not consider those people who take upon themselves to design gas-fittings are supplying what could be termed remarkably artistic designs. I am afraid it must have been in your own experience, gentlemen, as it has been in mine, to observe with something of pain some of the designs that have been put before us. They are not artistic; they are not æsthetic; and they are vastly inferior to the designs sometimes sent out by the same firms for electric lighting. At this time of day, there is surely no reason whatever why the designs for gas lighting should not be equally artistic. We have now admirable gas-burners, and nothing is more elastic than the management of our lights at the present time. I want, Mr. President, before sitting down again to express my very great pleasure at the paper that has been placed before us; and, like Mr. West, I am of opinion that it is one of the most important papers that could have been laid before the Association.

Mr. C. S. Ellery (Bath): Mr. President, I should like to say one word on this paper; and it is with reference to a statement made by Mr. Clarry in regard to outside attention. Although I fully agree that the staff should be thoroughly trained, I do not think it ought to be trained merely to sell inside the show-room. We have recently been pushing the sale outside the show-room; and I am surprised to find how a well-qualified inspector is received at the houses of the consumers. We have found out, by sending a very capable man, that it is necessary really to seek out the consumer at his own premises. I have been surprised to find how long-suffering some consumers really are. They put up with a bad supply rather than, as they say, trouble the gas company. We are at present engaged in sending out inspectors to ascertain where the weak spots are; and if I might make a suggestion, I think it would be worthy of consideration by those gentlemen who have not yet sent inspectors out into the district. It has been said to me, "You are only seeking to cause people to make complaints;" and at first sight it seemed as if there might be something in that. But experience has proved it to be altogether wrong. In some districts which have been taken into the City of Bath by the extension of the boundaries, our Corporation, no doubt in their wisdom, are proposing to run their wires right through. I was curious to know the position my Company held in the minds of those in the district, and I find that the result of a very careful canvass is that we are standing higher than we really expected to be. Therefore I say, with the utmost confidence, that I think the work of the show-room is not complete unless we send out from it into the district an inspector who will be able to meet the needs of the people on their own premises.

Mrs. Cloudesley Brereton: Mr. President and Gentlemen, I only wish to make one reference which occurred to me after the speaker who spoke about the same firm having ugly and pretty things for gas and electricity respectively. I made a point lately of going to some of the big shops like Harrod's and Selfridge's, where I am a good customer. I also went to Oetzmann's, where I made a point of closely inspecting the show-room. They thought, being well-dressed, that I should know nothing about gas, and they showed some of the most ridiculous things. Then I went to another place; and I saw the most beautiful things for electric lighting. I said, "Will you show me what you have for gas?" In response to my application, they showed some really appalling things. I said, "If I have gas must I have those things?" The salesman said, "I am afraid you must." That is all the young shopman knew about his department. I went to one of the other firms; and there I saw things for gas which were so beautiful that even in our show-rooms I have not seen them equalled. I think it might be well where you have lady demonstrators to let them go about among the big shops without saying who they are and make inquiries. If you go in the ordinary way and say "Let me see what you have for gas and what you have for electricity," you will find that in some of the very large London shops they have much better things for electricity. It is pure ignorance on their part, because it does not matter to them. I went to one of the largest places in London and said, "I have some valuable candles and I should like to have them converted for gas;" but they said it could not be done. Then I told them who I was, because I was so furious at the way they treated me, and I knew they were telling other women the same thing. As I say, I think it would be well to send women round to make these inquiries, and then they could pass the information on to the makers which could be followed up.

Mr. W. D. Helps (Leeds): Mr. President, as one of the poor unfortunate designers referred to, I should like to say a word here. It is that in our experience with regard to electric-fittings and gas-fittings, when any lady or gentleman comes into our show-rooms we tell them at once if they see an electric-fitting they would like converted into a gas-fitting, or any gas-fitting they would like converted into an electric-fitting, they can have it done. Then there is just one other word I should like to say; and it is in regard to the question of switching on and off the gas. We have had many architects in our show-room; and when we pointed out to them that the gas-fitting was designed to imitate the electric light, they said "We do not want any imitations." I mention this because we have got now into a stage when everybody seems to be talking about having light when they have no light; and I do not think we want to get down to the days of dark houses and dark streets. I think the most beautiful thing is to see our suburbs well lit up. We do not want to have too much switching on and off for domestic purposes. I think this is a point on which we might easily go too far.

The President: Gentlemen, as I completely and entirely differ from the last speaker, I will ask Mr. Broadberry, who I think knows quite as much about automatic lighting and extinguishing as anyone, to say a few words to you. I understand that he has some diffidence about it, because he has a financial interest in the matter; but I am quite sure we know him well enough to be able to trust him.

Mr. A. E. Broadberry (Tottenham): Mr. President, I am very much obliged to you for this opportunity of differing very strongly from our friend Mr. Helps in regard to the importance of distant control over gas lighting. There are the two forms. There is the indoor and the outdoor, both of which I consider are very important indeed. With regard to outdoor lighting appliances, first of all I think that we must all admit, apart from the saving that may be effected by controlling public lamps from one central station, it is very important that we should consider the lamplighter who in the ordinary way, no matter what the weather may be, however inclement it may be, is expected to go out and do his round and have the lamps lighted by the time darkness comes on. Very often this work is put upon old men, who certainly ought to be indoors when it is raining hard. And yet everybody expects the public lamps to be alight, no matter what the weather might be, at the appointed time. The poor old chaps have to go round in storms and cold winds to perform the work which can quite well be performed now with the appliances we have, and worked from a central point. In addition to the humane view that I have just expressed, there is considerable economy to be effected by this means. It brings gas lighting exactly up-to-date; and I am sure none of us would like to go on being out-of-date when we have the means of proper control by modern appliances. Then, again, with regard to indoor lighting, it is possible now to satisfactorily control the gas lights of a room from the door. There are various appliances for the purpose. There is the pneumatic system which many of you know; and there are various kinds of

electric control which need only a small dry-cell battery to operate them. Then, again, there is one kind which simply has an electric control for operating the valve. But the one that I am now more particularly interested in is one known as the "Telephos," where you not only have the control from the door or from the bedside or from both, but you have electric ignition as well. This only needs a little 6-volt battery, and is very reliable. The system has been struggling forward now for several years. It had a great many difficulties to overcome; and so far as the mechanism was concerned had successfully overcome them for upright burners when the fashion became popular for inverted gas-burners. This put them somewhat in a difficulty, because the heat from the burner was apt to cause the valve to become sticky, and sometimes it was troublesome as a consequence. I am glad to say, however, that for the coming lighting season a new system is to be put on the market. Instead of the mechanism being sealed-up inside a little gas chimney, the whole of the mechanism will be accessible. It will be so simple that anybody, if anything should go wrong, can give it attention; and the little cock can be taken out and wiped and put back again if it should get sticky. So that the ordinary maintenance man will be able quite well to give it any little necessary attention. Then, again, a further alteration is that, in addition to now being able to fit up a whole house with this system, sets will be put on the market where at the door a press-button is fixed on to a little ornamental box containing a small battery, which is sufficient for operating one light; so that these things can be shown either in a gas company's show-room or in any ordinary gas-fitter's shop. Anybody can run them from the door over to the gas-fitting; and the whole thing would be complete, without the necessity of boring any holes in the walls or anything of that description.

The PRESIDENT: I am afraid, Gentlemen, that the discussion must now be brought to a close, as we have reached the limit of our time; and I think it is due to the reader of the next paper that I should call upon him. Before doing so, however, may I say just one word; and it is that I think the greatest merit of Mr. Clarry's paper is to be found in the last paragraph. That is really the end to which all the points raised are mainly directed; and I called upon Mr. Broadberry particularly because I am satisfied that the ease and the simplicity with which the electric light can be turned on and off is one of its greatest recommendations. If, in a gas-lighted house you have either to strike a match in order to light a burner whenever you require it or, as Mr. Helps would have us do, leave all the lights burning all over the house in order to save the trouble of striking that match, clearly, on either horn, it is a dilemma that handicaps us very much. I remember, when I was a youth, that my chief had an expression which he used very frequently, and that was the "elasticity of the gas manufacture." Now I think that what we have heard to-day shows that there is a degree of elasticity left not simply in gas manufacture, but also in the application of gas, that is very encouraging to us. I agree with my friend, Mr. Canning, that we must not, in our enthusiasm for the distribution department forget that there is very much to be done yet in the gas-works and in the producing department. If we cannot make gas and deliver it at a low price, it will be a very serious handicap to the salesman. We are improving from year to year in these respects; and I am quite satisfied that there is in front of us still an excellent prospect for material improvement. There is just one other point that I should like to make, and that is the importance of extreme care in the purchasing of stocks of stoves of various kinds, and fittings, because of the burden they become when they are, for any reason, obsolete. If we are to have the "show-room of a satisfied consumer," we must not leave in his house things that are inefficient or obsolete; and if we are to take back the thousands, and tens of thousands, of fires and stoves that have been used in early days, when the improvements of next year come along, the cost of working will become simply enormous. There must be some care exercised in striking the mean between the scrapping of that which is not up-to-date and the leaving, to the disparagement of the business, of apparatus which is not of the very best. I will now formally put the resolution: "That the thanks of the meeting be given to Mr. Clarry for his most excellent and helpful paper."

The resolution was carried with applause.

Mr. GEORGE CLARRY, F.C.I.S. (Cardiff): Mr. President and gentlemen, as time is on the wing, I shall have to resist the temptation to spread myself out now that I have got away from the confines of the printed matter. I can assure you that my paper was commenced with feelings of great diffidence. The idea was to address a company of experts, and I have strictly avoided any attempt, shall I say, to play to the gallery. I knew that you would be fully acquainted with many of the methods adopted by gas individuals in promoting and increasing their sales; and that leads me to the suggestion so very nicely put by Mr. Ellery as to the inspectors. You may take it from me that we neglect nothing in the way of our inspectors in the canvassing department. Rather do we find that the show-room becomes a convenient rendezvous, where the inspector can bring the householders, whether they consume gas or not, and can point out to them the advantages and suitability of certain fittings or stoves. The consumer invariably says: "I like that better than when I saw it in your catalogue. I like it in that position, and will have one." That leads to business, and, therefore, we do not neglect it. But in sending my draft of the paper to one whose opinion I value very highly, when it came back I found that he had cut out seven of my most spicy paragraphs. I said: "What is that for?" He said: "That is not 'show-room;' you keep to your text." That, gentlemen, is my excuse for omitting any reference in the paper to outside canvassing. Now there is a thorny question raised, and that is with regard to ventilation. If Mr. Westlake can kindly tell me of any better system of ventilating my show-room than the one I have adopted, I am quite prepared to entertain it. You make use of electricity in your retort-house, and for many other purposes, I believe, and I can see, shall I say, no unsportsmanlike conduct in providing an electric fan in a show-room, if the electricity is generated by a gas-engine. Now, we have several very large works in our neighbourhood where they use electricity both for lighting and for power. We not only do not discourage them from using electricity, but we say: "We think it will suit you best to have a gas-engine to do it with;" and many is the order that we have received in consequence. If they will have electricity for their trade, why not generate it from one of our gas-engines? I am much obliged to Mr. Canning for suggesting a central show-room. It is always a serious question to scrap anything; and we were lucky that we did not have to scrap our old show-room, because it continues to do the same business as it did before. We shall be only too glad to receive any suggestions from large towns, such as London, where I believe they have most suitable show-rooms in their central thoroughfares. I am heartily in sympathy with Mrs. Brereton's suggestion. I have played the "innocent" many times, though perhaps it was not quite fair. I have been through the Army and Navy Stores, and many other big places, and asked all sorts of questions, and I find that their ignorance of gas matters is simply colossal. One thing that has pleased me more than anything is the intimation that Mr. Broadberry has given us that we shall have, in the future, much more reliable switch-lighters. People have told me that they can get the electric light for about the same price as gas; but personally I do not believe it. Whenever I have said so, their comment always is: "When we go out of the room we can always switch the electric light off, but we cannot be bothered with doing that with gas." I sincerely hope, therefore, that we shall have such methods of lighting and turning off the gas that there will be no question raised in this respect. I assure you that I feel greatly honoured at the way in which my paper has been received. I put no apology at the commencement of it, and I finished with no apology; but I do apologize to you for bringing before you such a very crude paper. It was merely suggestive; and I hope that some of the questions raised in it will be brought forward at future meetings, particularly the terms on which we should let our stoves. Personally I have always been optimistic towards gas, and I hope I always shall be.

The PRESIDENT: Gentlemen, before calling on Mr. Bell to read the next paper, I should like again to express my regret at having had to close this discussion, evidently long before it was properly exhausted. A suggestion has been made that some time between this and our next regular meeting we may have one other meeting—say in association with the Commercial Section of one of the District Associations, where, if it is felt desirable, we could take up the discussion of any paper that was not fully discussed at the larger meeting. This is a matter to be considered by the Committee; but it may be some consolation to those who would like to have taken part in the discussions.

DEVELOPING THE SALE OF COKE.

By J. FERGUSON BELL, M.Inst.C.E., of Derby.

The increase in the manufacture of coke, especially that used for metallurgical purposes, has during the last half-century made enormous strides, with the result that it is now an important industry, generally conducted on scientific lines and on sound economic principles.

Formerly, coke-making by the old beehive type of oven was a crude process. The whole of the valuable volatile constituents were lost, and, in addition, 10 to 12 per cent. of coke, due to air admitted to the coking chamber. A great advance was made by Coppèe, who, in 1861, introduced horizontal retort-chambers, excluded air from the ovens, and utilized more efficiently the gases expelled during the process of coking to heat the chambers, which being horizontal were more easily discharged. Simon-Carvès in 1869 erected in this country horizontal chamber ovens with bye-product recovery plant. But not until more recent times was the recovery of bye-products considered compatible with the production of high-class furnace coke. However, this prejudice has disappeared; it being found, upon extended practical experience, that there is little or no difference. Now coke-ovens without bye-product recovery plants are properly regarded as wasteful, and often so unremunerative as to compel the erection of modern ovens with recovery plants.

However, it is rather the production of gas coke with which we are more immediately concerned—which is the fixed residue of coal distillation in the manufacture of illuminating gas—so-called to differentiate it from furnace coke. This at the present time is commercially by far the most valuable bye-product of the gas industry, and one worthy of consideration at the first conference of the British Commercial Gas Association.

A reference to that admirable annual publication, "Field's Analysis of the Accounts of the Principal Gas Undertakings of the United Kingdom," and later the no less valuable "Gas World Analysis of Gas Companies and Municipal Gas Accounts" for 1910-11, will show that the average return for coke and breeze amounts to over 5s. 1d. per ton of coal carbonized, whereas all the other bye-products together yield barely 3s. 9d. per ton of coal, making a total for residuals of 8s. 10d. per ton of coal used. In round figures, this is a return of 72 per cent. on the cost of coals, of which coke and breeze produce no less than 42 per cent., and all other residuals combined just over 30 per cent. Hence this most important of all bye-products assuredly merits special attention, both technically and commercially, as upon its profitable disposal depends to so large an extent the financial success of any gas undertaking. These relative figures will, of course, vary from year to year according to the market prices of bye-products, but net receipts from the sale of coke generally predominate.

The production at gas-works of hard coke suited for metallurgical purposes, is at present only of interest to a few; but the manufacture of gas coke, applicable to general use, and the consideration of methods likely to ensure its advantageous disposal, so as to yield the highest possible return, especially now all kinds of coal have recently advanced so much in price, will probably appeal to most present.

Although an enormous quantity of hard coke is required for metallurgical and kindred industries, yet there is a demand for gas coke, which is more suitable for many purposes, both industrial and domestic. This demand requires to be cultivated. With this end in view, gas manufacturers should give the matter special consideration, and endeavour to produce a coke that is particularly suitable for the trade of the district where it is produced, and especially for general domestic heating, whereby a more general use of smokeless solid fuel would result. Ordinary household coal, when burnt in an open grate or closed range, usually produces unpleasant gases, with always more or less smoke and soot, the injurious effects of which are noticeable in most large towns, by a thickened and engloomed atmosphere, especially in the winter months, due to factory and house chimney smoke, whereas Continental towns, in which coal smoke is not permitted, are noticeably cleaner, the buildings not being darkened by sooty vapour. A more strict enforcement of smoke prevention would be to the advantage of the community generally.

Coke, on the other hand, burns without emitting smoke or soot, because the volatile constituents which give rise to them in the case of coal are expelled in the process of carbonizing. This being so, the question naturally arises, Why is coke not more generally used in preference to coal? There must be some tangible reason. No doubt, one is that in many places insufficient importance is attached to the kind and quality of coke produced, and little or no effort is made to popularize it. It is simply trucked-off to the nearest district where there happens to be a demand, possibly the result of years of patient efforts on the part of the local company or corporation interested in its production and sale. It may be at considerable expense a local demand has been created, which is thus appropriated, sometimes resulting in an unnecessary all-round lowering of prices, perhaps without much benefit to the consumer—the coke being sold and re-sold again before it reaches the user. In some districts the demand is greater than the local production can meet. This must obviously be supplied by outside production.

A comparatively small tonnage of coke sent into a district at a low rate may cause serious depreciation in prices all round; hence care should at least as far as possible be taken not to undersell one's neighbours to their detriment. It is not proposed a ring should be formed to artificially inflate prices. It is, however, difficult to understand why coke in one town is only worth 7s. 3d. per ton, whereas in another it yields an average of over 18s. 6d. per ton. Position and the local demand count, but surely not for so great a difference.

The kind of coal and system of carbonizing have an important bearing upon the resulting coke, which, if intended primarily for domestic use, should be light and porous, broken to a suitable size and form, so that a large surface may be exposed for ignition, as coke burns only on the surface, and if dense is difficult to burn without a strong draught.

The ratio of combustibility of ordinary coke to that of coal is generally about 2 : 3; and this slower rate of burning makes it very much more advantageous to use for many heating purposes. If necessary, the rate of combustion and inflammability may be increased by the addition of a small quantity of small coal or slack.

So much then for the advantages attending the use of coke. Upon considerations of health, as well as upon economic grounds, the more general use of coke for heating purposes is desirable, and should continuously be brought to the notice of possible users. Thereby local sales may be enormously increased.

For each ton of coal carbonized, there remain for sale about 10 cwt. of coke and breeze. The average gas consumption in round figures may be taken at 33,000 cubic feet per annum for each householder. This necessitates 3 tons of coal for the production of illuminating gas, giving 30 cwt. of coke and breeze for sale per consumer (if a proportion of carburetted water-gas is made, the quantity may be reduced to 20 cwt.), which is not one-third the quantity of solid fuel required per householder for heating purposes, without taking into account the tonnage used for trade and industrial purposes. From this it would seem that every gas undertaking, irrespective of its geographical position, should be able to dispose of the whole of its make of coke within its own area of gas supply. If this desirable object could be attained, it would end the senseless and wasteful competition that now unfortunately too often takes place between various towns and districts, which results in unnecessary lowering of prices, and loss due to expenses of transit and resale.

In a recent number of the "Engineer," attention was drawn to coke not being sufficiently well recognized by engineers in general, and to the fact that gas coke is of considerable value as fuel in suction-gas plants supplying gas for the development of power. It is stated to be a satisfactory fuel, and its low costs make it superior to many grades of anthracite. In a comparative statement of costs, gas coke is put down at the low price of 10s. per ton, and anthracite at 25s. per ton. Why this enormous discrepancy in prices? Is the gas industry not sufficiently alive to the value of its most important bye-product, or is it anxious to supply with the sinews of war a competitor who, when making comparisons between suction gas and town gas, for cost of power, generally only takes into account the cost of fuel? By all means cultivate the use of coke for all purposes for which it is adapted, but see that a price is obtained commensurate with its value. Anyone can sell at low prices; but this is not sound business. It is the aim of the British Commercial Gas Association to cultivate the best

business methods in dealing with coke as well as other bye-products, by exchange of information and prices current; and for this reason alone every gas undertaking should become an active member.

The quenching of hot coke often leaves much to be desired; if over-quenched it becomes saturated with water. Producers should remember consumers do not want to buy water, which, in addition to being detrimental to the coke, results in serious loss to the purchaser, in consequence of the high specific and latent heat; also moisture present makes it more difficult to kindle, and produces an unpleasant crackling sound when burning.

The sulphur contents and ash present vary enormously with the quality and seams of coal carbonized. Some bituminous coals are particularly weak in respect to their coking qualities, and only produce weak and inferior coke, which may be suitable for certain trade purposes; but when required for domestic purposes it is most desirable to produce a good coke of even quality with a low content of sulphur and ash. This may be obtained by a careful selection of coals carbonized, special attention being given to see that the coal is properly cleaned from pyrites and other injurious refuse before being coked.

The heating value of different kinds of coke can readily be ascertained by the well-known Lewis Thompson or more recent Féry bomb calorimeter, which is somewhat similar to the Mahler instrument, but greatly simplified in details. Or it may be calculated from the percentage composition, with sufficient accuracy for all practical purposes, by simply taking the total heating value of the carbon and hydrogen present, thus—

Calorific value in B.Th.U. (1 lb. of water raised 1° Fahr.)
= 14,500 C. + 52,000 H.

The heating value of good coke is about 13,000 B.Th.U. per lb., which is the same as ordinary coal, the coke containing not more than 5 per cent. of moisture and about 8 per cent. of ash.

The inflammability of coke proposed to be used as a substitute for coal is obviously of importance. This depends upon the volatile constituents present and its physical properties, such as hardness and porosity, and also moisture contents and size of pieces, all of which should receive attention. Porous coke occupies more space in proportion to its weight. Consequently, it is preferred for domestic use; and as it exposes a larger surface to the oxygen of the air it is more easily burnt.

It is well known that coke is more difficult to ignite than coal. It requires a bright red-heat—about 1200° Fahr., whereas coal will ignite at as low a temperature as 600° Fahr.; and it is necessary to burn it in a thicker layer than coal, in order to maintain the ignition temperature. It possesses, however, distinct advantages in consequence of its very much slower rate of burning.

As already referred to, the net receipts from the sale of coke (taking extreme cases) vary from 1s. down to just over 3d. per 1000 cubic feet of gas sold; and it is hard to believe this enormous difference is solely due to geographical position. The District Commercial Associations, by the dissemination of prices, stocks, &c., will no doubt in future enable a higher all-round level to be now obtained for the most important bye-product of gas manufacture.

Each undertaking, however, should do its share in the popularization of this valuable smokeless fuel by suitably preparing it for domestic use, and affording facilities to the large and small householder to obtain it as required in large or small quantities, and should in addition push the sale for industrial trade use. Some companies sell it in ¼ cwt. lots, packed in brown paper bags; others deliver it in ½ and 1 cwt. bags. No universal rule can be laid down; but let it be readily available to users, bring its merits before householders, see that it is properly prepared and suitable for use intended, and the reward will come. It is a good plan to advertise coke in the local press, so as to keep it well before the public.

Attached to this paper is a copy of a form for the sale of coke by contract, as it is desirable when selling large quantities for delivery over a period to exchange between buyer and seller signed bought and sold contract notes which clearly specify the conditions of sale, and so preclude possibility of misunderstanding on either side.

It is desirable for most gas undertakings to put into stock a certain quantity of coke during the winter months. This serves a double purpose. It tends to prevent a larger quantity being put on the market than can be absorbed without undue lowering of prices, and enables sellers to guarantee a full supply of coke during the summer months when the production is reduced consequent on the lessened demand for gas.

The sale of coke, either direct to the consumers by the corporation or gas company, or through coal and coke factors, is one upon which there is much diversity of opinion. Local custom no doubt accounts for much in this respect; but, generally speaking, it should not lightly be altered. It is preferable to deal direct; but when the coke is sold through a factor, he should receive a reasonable payment for his services. The author finds that it works well to allow a commission of 10 per cent. to solely *bonâ fide* coal and coke merchants when the business passes through their hands, upon them agreeing only to sell in the district the local make of coke upon the same terms as the gas company or corporation. The sale of large spot lots of coke to factors for immediate removal into another district, irrespective of the prices bid, is to be condemned, and should only be resorted to under extreme pressure of circumstances. It will generally be found to pay very much better to put it into stock, even at some expense and inconvenience.

A more general use of smokeless solid fuel in towns and large manufacturing centres would conduce to the health and well-being of the people, bring about clearer and purer atmosphere, and allow more sunlight to irradiate and brighten our dwellings.

The_____Gas and Coke Company.

COKE SALES DEPARTMENT.

_____

We have this day sold to you as follows :—

*Quantity*_____

*Quality*_____

*Price*_____

*Time of Delivery*_____

*Mode of Delivery*_____

*Terms of Payment*_____

*Remarks*_____

CONDITIONS OF SALE.

1.—Deliveries may be wholly or partially suspended during the whole or partial stoppage of work at the collieries from which coal supplies are drawn, or at vendors' works, through strikes, lock-outs, or accidents of all kinds, railway or transport workers' strike, or any other occurrence beyond the control of the vendors.

2.—Suspended deliveries arising from any of the before-mentioned causes shall be delivered after the cause of stoppage has been removed at the contract rate of delivery, and this contract shall be extended to enable such suspended deliveries to be made.

3.—The failure of any one delivery not to vitiate or affect this contract.

4.—If after the date of this contract there shall be any increase or decrease in the railway rate, the contract price shall be increased or decreased in the same proportion.

5.—If the purchaser shall make default in any payment, or shall become subject to the Bankruptcy Law, or make a Deed of Assignment for the benefit of, or composition with, his creditors, the vendors may at their option cancel this contract, without prejudice to their right to recover all moneys then owing to them for previous deliveries.

*For the*_____*Gas and Coke Company,*

_____

*Date*_____

Discussion.

Mr. Thomas Berridge (Leamington): Mr. President and gentlemen, I have very much pleasure in proposing a vote of thanks to Mr. Bell for his paper. I shall be very brief in anything I have to say, because I am quite sure many of you want to join in the discussion. I would merely remark that I hope we shall take to heart all the valuable hints he has given us. He has made it quite clear that we, all of us, can sell our own coke in our own districts, and that a ton of coke is as valuable as a ton of coal. The coke will last longer and will be more useful to us in the end.

Mr. R. S. Hilton (Birmingham): Mr. President and gentlemen, I wish to congratulate Mr. Bell on drawing the attention of this Association to one of the chief features in the manufacture of gas, which I venture to think has hardly received the consideration which it merits. As both Mr. Bell and Mr. Berridge have said, much can be done by co-operation and the interchange of information. But the problem comes down to a local one after all; and if we can sell our own coke in our own districts, it would be a great advantage. Might I suggest, where large quantities of coke have to be sold, that it might be worth our while to introduce a coke salesman into this particular department. Such a man would be of very great service to any large undertaking (say) producing 100,000 tons of coke per annum. It would only cost you probably 1d. per ton of coke sold, and, surely, it is well worth while having something of this kind where, by spending 1d., you may be able to save something like 6d. a ton. Mr. Bell's references to metallurgical coke interested me particularly, because we, in Birmingham, hope, within the next couple of weeks, to put on the market a blast-furnace coke made in coke-ovens. This shows you how particularly local a demand like this may be. We are, in Birmingham, quite close to the Black Country, and we have a large industrial demand for this kind of coke; and I have no doubt that we shall be able, successfully, to serve the people having blast-furnaces in our own neighbourhood. I have much pleasure in seconding the vote of thanks to Mr. Bell for his paper.

Mr. H. Kendrick (Stretford): Mr. President and gentlemen, I have much pleasure in supporting the vote of thanks, because I find that Mr. Bell is a convert to the work that has been carried on in this district for the last ten or twelve years. It seems to be somewhat a remarkable thing that a paper of this kind should come from a gentleman who is a member of the only district that has not its Commercial Section. Stripped of that portion of the paper which is purely on the manufacturing side, and which would be better, probably, discussed at a meeting of the Institution of Gas Engineers, it is a splendid exposition of the manner in which the Commercial Sections of this country do their work. I am sure if the Midland Association at Birmingham, as well as the rest, could only attend some of our meetings and have the information which has passed through our hands, they would reap an advantage in the increased price of their coke. It is a matter that is discussed at every meeting we hold. I shall be glad to see the paper in print, so that we can always refer to it. It will most certainly be of great use to us in the future.

Mr. E. Allen (Liverpool): Mr. President and gentlemen, without taking up much of your time, may I at once express the very great pleasure I have had in listening to Mr. Bell's paper. We recognize in the paper what is found in all Mr. Bell's utterances—much practical information, and the subject dealt with in a thorough manner. What this meeting wants is, of course, that some of the special points that he has been raising should be dealt with by those who have special knowledge. Although the subject of the preparation of coke more particularly belongs to the Gas Institution business, it may be interesting to know that coke can be prepared without being injured by the application of water. In Liverpool, we are to-day treating coke in this manner; and we are getting, absolutely free from moisture (with the exception of what may be obtained from the atmosphere), a coke which is not damaged in its structure by having water poured upon it, and a coke that burns without any crackling noise at all, but simply like charcoal. This coke has now been put on the market, and is a most satisfactory fuel. The dissecting of accounts may sometimes explain the difference between the 7s. 3d. mentioned by Mr. Bell and the 18s. 6d. in other cases, because, in analyzing accounts, we have found that some people put certain charges against their coke which others do not. So that, although there is undoubtedly a great variation in price in different towns, which can be explained in various ways, this may go to explain, to some extent, how these differences arise. Then, there is another point that I should like to make, and that is that, in my opinion, the competition that goes on between gas undertakings is most improper. Without mentioning any names whatever, we know that, even in this important Lancashire district, which is so well catered for by the Commercial Section that Mr. Kendrick has just referred to, there has, at times, been some most unpleasant competition. Take Liverpool, for instance, where coke was sold at panic prices, and was sold by merchants at a price under ours. The sellers gained nothing, and the district invaded lost, because, though the amount may not be great, it has an effect on fixing future prices; and the merchants to whom it is sent say: "We have had quotations at such and such a price, and we will not accept your offer." There is no doubt that the value of the Commercial Sections is very great; and I trust that Mr. Bell, who seems to be able to rise superior to his surroundings, will do something to bring about the formation of a Commercial Section in his own district. I am glad to have the opportunity of supporting my friend, Mr. Bell.

Mr. Robert Watson (Doncaster): Mr. President, ladies and gentlemen, we are much indebted to Mr. Bell, and I think that goes without saying. We always welcome what he contributes to the proceedings of our Associations; and we are particularly interested that he should have brought this subject before this meeting. We are hearing of increases in gas throughout the country, ranging from the region of 10 per cent.; and if the work of this Association is going to increase the output enormously, we shall have a much larger quantity of coke to dispose of in this country. Mr. Kendrick has referred to the work of the Commercial Sections. For my part, I do not think too much credit can be given to that work throughout the country; and those of us who have been intimately connected with the work of the Sections, from the initiation of it in our own district in Manchester, are fully aware of what has occurred in raising the price of coke and preventing the system of dumping coke from one district into another, to which Mr. Bell has referred. Two or three years ago, I had the privilege of compiling some statistics in regard to Lancashire and Yorkshire, and submitting them for the consideration of the members of the Manchester District Association, for the purpose of showing what the work of the Commercial Sections was resulting in. It was gratifying to find that as a result of the preaching, in and out of season, of the preparation of coke suitable for domestic uses—that is to say, broken coke—this had the effect of materially reducing the dumping of coke from one district into another and of increasing our local sales, with a consequently enhanced price resulting therefrom. I had the figures of something like forty to fifty gas undertakings, both large and small, in Lancashire and Yorkshire. In the year 1908, contrasting that with what had taken place in the year 1903, it was interesting to note that, in spite of the greatly increased quantity of coke which was being placed on the market in the different districts, in consequence of the enlarged use of gas, the local sales, where domestic coke had been prepared, had increased; while, on the other hand, the amount of coke sent out of the home district into other districts had decreased. In a number of cases, for instance, where broken coke was being sold, it was found that where the amount of coke sold increased something like 7000 tons, it was all disposed of locally; and, in addition to that, the quantity of coke sent out had decreased to the extent of some 4700 tons. During the five years from 1903 to 1908, as a consequence of the work of the Commercial Sections, a great number of undertakings started the preparation and disposal of broken coke in their own districts. There were no less than ten very large undertakings in the two counties which, during those five years, had an increased quantity of something like 20,000 tons of coke to dispose of, consequent upon the increased sale of gas. By adopting the tactics that Mr. Bell has advocated—that is to say, encouraging the trade in our own districts—the whole of the increased quantity of coke was sold in the respective towns where it was made; and, further than that, where they had sent out previously something like 26,000 tons of coke to other districts, the quantity was reduced to 21,000 tons. So that, as a direct result of the fostering of local trade, no less than 20,000 tons of coke were sold in those ten districts inside the areas of those particular gas undertakings. I think that is a very strong argument in favour of each and all of us in our own particular districts doing our very best to follow out the lines suggested by Mr. Bell to-day; and we are much indebted to him for having brought this subject forward. Mr. Bell, in his admirable paper, has made allusion to the work which the British Commercial Gas Association may be able to do in this respect. Further, I am hoping that the Commercial Sections will not be ignored, but that they will be brought in very shortly as branches of this Association, so that we shall be all working together throughout the country. I believe if it were possible to bring about a fusion of the Commercial Sections, and if they were brought in as branches

of the British Commercial Gas Association, we should form an exceedingly strong body for the purpose of fostering the coke trade of the country, and in the particular districts where the coke is manufactured.

Mr. JOHN WEST (Southport): Mr. President, I did not intend saying a word on this subject, but Mr. Bell has asked me, "What are you doing about coke? Are you helping us to make a better coke?" My answer is that we are endeavouring to do so; and I think we are succeeding. The coke question, you know, is a most important one when, as Mr. Bell tells you, you get a return of about 42 per cent. from your coke sales. Therefore it must be important. Now it is necessary that you should have a coke that is suitable for domestic purposes. The oven coke is not suitable; it is too dense. Some coal in horizontal retorts produces rather a dense coke. I will give you an experience of something that has taken place just recently. Probably some of you are aware that foreigners are much more particular in this respect than Englishmen, because they often get a much higher price for coke when it is prepared for use. There was a foreigner who came over here not very long ago; and he said to me, "I want to know what kind of coke is produced from vertical retorts. If they produce better coke from the same kind of coal that I am using, I shall adopt vertical retorts." I said, "Try for yourself. Send some of the coal over, and come and test it for yourself, and then you will see for yourself." He did so. He brought his own weights and measures and everything; and he tested the coal and the coke. The result was that he found that, in his opinion, better coke was produced from vertical retorts than was produced from horizontals with the same coal, and he gave an order for the apparatus. Now I think that is pretty conclusive evidence. There is no moisture in the coke that is drawn from the system of continuous vertical retorts. In that system the coke is continuously on the move, and it has not time to get so dense as it does where it is in a stagnant condition for ten or twelve hours. We produce coke without moisture; and it is the most suitable coke, so far as I know and as far as I have yet seen, that has ever been produced in gas-works for domestic purposes.

Mr. H. JAMES YATES: Mr. President and gentlemen, I will be very brief in the few remarks I have to make. It occurs to me that, as we are here more or less with mutual interests, if as time goes on gas companies can see their way to make metallurgical coke they will find that the gas-apparatus makers will be ready to use it, so that they will not have any difficulty in disposing of the increased quantity of coke they make. I am glad to hear from Birmingham that they are making this metallurgical coke; and I shall be very glad to have an opportunity of testing it.

Mr. J. FERGUSON BELL (Derby): Mr. President, ladies and gentlemen, I thank you for the kind reception you have given to my paper. It was written with a view to ascertain what was being done in other districts with respect to coke; and I am sure the discussion will add very much to what little value the paper may possess. I thank my good friend Mr. Berridge for the remarks he has made. I am sure all the members will be glad to hear that an experiment is being conducted in Birmingham in the production of metallurgical coke. I agree with Mr. Hilton as to the desirability of gas companies or corporations having a coke salesman; but he must bear in mind that there are not many undertakings where they have 100,000 tons of coke to dispose of. I was very glad to hear Mr. Kendrick's remarks with regard to the Commercial Sections. We all know the work he has done in connection with the Sections; and if he had been in the Midlands, we should before now perhaps have had a Commercial Section of our own. He will be glad to hear that I did send notice to the Council that it was my intention at the next meeting of the Association to take steps to propose that we should have in connection with the Midland Association a District Commercial Section. My good friend Mr. Allen referred to a matter which I think is of great importance—that is, the dry cooling of coke. There is no doubt that coke is very often sent out in an unsatisfactory condition. It contains far too much moisture. It is often not properly prepared; and if we are to get consumers to use it, we must give them an article that we can recommend as being suitable for the purpose required. I would like to emphasize his remarks in regard to the proper preparation of coke for domestic purposes. Then Mr. Watson drew attention to the fact that there has been a great increase of late in the production of gas, which, of course, means a corresponding increase in the production of coke. It is, therefore, necessary for us to take all steps possible to popularize coke, so that it shall not be a drug on the market. We are all glad to know that Mr. West's system of continuous carbonizing produces a better coke. I must again thank you, gentlemen, for the kind reception you have given to my paper.

A CAMPAIGN AMONGST THE DOCTORS.

By H. H. CREASEY, of the Gas Light and Coke Company.

As publicity, or the spreading of truth and light about our industry, and the dispelling of old prejudices, is the principal aim of the British Commercial Gas Association, the subject on which I have been asked to read a paper to this meeting is, I think, a very suitable one. My only doubt is as to whether I am capable of doing the subject full justice, both from the personal point of view, and in the time at my disposal.

Everyone of us here is aware that within the last decade there have been great improvements in the manufacture and fixing of gas-fires. But we are also aware that gas-heating is scarcely more than in its infancy; and I, for one, believe that we are on the verge of a great boom in our output of gas-fires. Take offices, for instance; I am sure that it is only just being realized that gas heating is now very closely competing with coal as to cost—quite apart from the advantages attached to dispensing with (1) the dependence on the housekeeper to light the fires, (2) the annoyance of keeping them alight, and (3) the dirt and dust, and consequent additional expense of cleaning, sweeping chimneys, &c., which accompanies coal fires.

Within the next ten years—bearing in mind the already low price of gas, and the possibilities of still further reductions, as well as the steady and constant improvements in gas-fires and heaters that are taking place—I venture to prophesy that an office heated by any other means than gas will be a rarity, and that the use of gas for domestic heating will also have increased to a remarkable degree, unless competition arises from some unknown or unlooked-for source.

I may seem to have wandered from my subject; but I am really leading up to it. Such a boom as I have (I hope truly) prophesied would have been impossible in the past—partly owing to errors in the construction and fixing of old pattern gas-fires, but to a much greater extent owing to the prejudice that existed on all sides against the use of gas for heating.

This prejudice up to a few years ago was very hard to overcome, and was to a great extent caused by the antagonism shown to gas heating by a very large number of medical men and other scientists who—having had personal experience of the use of badly constructed or badly fixed gas-fires, or of a combination of both these faults, or else of good fires well fitted, but suffering from lack of skilled attention, and in addition to this having come into contact with similar defects in the houses of their patients or friends—condemned gas heating as being unhygienic. It must be admitted that they were to a certain extent justified in this action.

THE DOCTOR'S INFLUENCE.

Now the medical man is a very real power in almost every household, and his opinions on questions of hygiene have generally (and justly) great weight with patients—especially those of the fairer sex, who, of course, have a great deal to say on what shall—or shall not—be used as the heating agent for the household. Every individual is a patient at various periods of his life, from his birth to his death. Very few houses are out of touch with a doctor; and if all doctors condemned gas-fires, instead of so generally recommending them as they now do, we might exert much energy, and expend much money, in refuting their statements. But a great amount of damage would be done to our cause, as the disinterested opinion of the doctor, however unsound, would be regarded as far outweighing the statements of interested parties.

We all know that it is a fact that, some years ago, it was by no means an uncommon thing for a doctor to order a gas-fire out of a patient's bedroom, or even to advise a patient not to have one in his house. This patient told others; and so the damaging news spread—doing our industry incalculable harm. While a large number of medical men were doing this as a matter of course, and were actively antagonistic, the great majority of the remainder

were indifferent, or what I may call passive resisters, and when asked their opinion, either advised *against* the use of gas heating, or else "damned with faint praise." Of course, there were doctors many years ago who used and recommended gas-fires, but their number was small; and, from my experience, the fires they had in use in waiting or consulting rooms were often calculated from the advertising point of view to do us a great deal more harm than good.

Seeking to Satisfy the Doctor.

This was roughly the position when, some five years ago, my chief (the Chairman of the Association's Executive) came to the conclusion that some special steps should be taken to bring about a more satisfactory state of affairs. Mr. Goodenough realized that, though we could truly speak of gas heating as being hygienic, we must not expect by saying this quickly three times (or indeed by merely "saying" it seventy times three times) to change the opinion of thousands of medical men and hygienists, who had in the past seen and experienced examples to the contrary, and who—either owing to lack of opportunity for giving close attention to the subject, or from sheer indifference—were unaware that gas-fires that were absolutely hygienic could be obtained.

Upon his recommendation, therefore, the Directors of my Company decided—instead of being content with merely stating the truth and waiting until doctors had proved it for themselves if they took the trouble to investigate the subject—to institute an active campaign among those members of the medical profession who practised within our supply area. The object aimed at was to persuade them to allow us to: (1) Instal gas-fires or heaters on trial where none were already in use; (2) fix extra ones where some were in use and arrange for their free upkeep and periodical inspection; (3) undertake to overhaul and to examine periodically and keep in good condition free of charge those already in use; (4) exchange bad, out-of-date ones, for modern ones where necessary. In other words, the object was to induce doctors to give gas heating upon modern lines a fair and unbiassed trial, on its real merits.

The Plan of Campaign.

When the campaign was opened, the field might be spoken of as practically untouched; but I can assure you that it was very hard and stony in parts and difficult to plough. The first step taken was that of sending letters to each medical man in our area, emphasizing the hygienic value of gas heating, and offering to fix a gas-fire on trial, free of fixing charge, in any room chosen by the doctor. The rent or purchase price of the fire was not to be paid, unless and until the doctor was satisfied with the result. In addition to this, an offer was made to overhaul and keep in condition, free of charge, any gas-fires already in use, or to exchange, free of fixing charge, any out-of-date fires.

This, it may be pointed out, was a concession that is not offered by us to the general public; but we have always pointed out to the doctors—or to any customer, who, having heard of this system, asks why *he* does not have the same privileges—that it is really to the interest of the general public that we should carry out this work, in order that medical men and other scientists should have the greatest facility for giving gas heating the best test of all—viz., personal use and observance in their own households and institutions—and thus be enabled to give expert and valuable advice on the subject to the general body of the consumers.

I must point out, however, that the doctors in all cases have paid (and continue to pay) for all the gas they consume, *plus* the hire or purchase price of the fires, when approved.

First Results.

Our first batch of letters produced a fair number of replies; but the majority of these were either simply negative, antagonistic, or sarcastic—such replies as "Nearest gas, street lamp-post;" "Don't want your gas-fires;" "No thanks;" "Would not use a gas-fire;" "Always recommend my patients not to use gas-fires," &c., predominating. The result not satisfying Mr. Goodenough, at the end of January, 1908, he instructed me to "go out and endeavour to obtain converts."

I can remember his sending for me, and telling me that, as the replies did not satisfy him, he wanted me to call on the doctors and induce them to give gas-fires a trial, or to let us improve any they had in use. When I thought of the task before me, having a fair knowledge of the extent of the opposition with which I was likely to meet, I felt like the smallest of small boys about to attempt to push a huge stone up the side of a mountain. However, I determined to do my best. I took my courage in both my hands, and had a "shot" at the Harley Street neighbourhood first—I suppose because I thought I might as well be killed right out at the start as die a lingering death. My method of procedure was to select from Churchill's "Medical Directory" the names and addresses of some of those who had not replied (I had plenty to choose from), then call and ask to see the doctor.

Initial Difficulties.

Have you ever met the butler or head housemaid who opens the door at a Harley Street physician's or surgeon's residence if you are not known, or have not an appointment? I have. He (or she) has a sort of supercilious or "No bottles to-day thank you" air, at times. You have no doubt heard of the "Twelve Pound Look" being fatal to husbands. Well, the "No bottles" look is just as dangerous to the hopes of a gas company's representative who is calling to see someone who does not want to see him. It is worth a guinea for these superior servants to open the door; and I can assure you that almost the greatest difficulty was, and is, to get past them to interview the doctor. I very quickly found that it was useless to say I had called with reference to the letter we had sent. The answer was either "The doctor has not seen it" or else "The doctor has replied, and does not wish to see you." I found it better to put on a mournful appearance (not difficult under the circumstances, I can assure you), hand in a card, and ask to see the doctor. "It was rather important," &c. By the exercise of great tact, I frequently managed to get shown into the waiting room, where I would possibly sit with a row of patients of all sorts, and I have caught myself now and again wondering which of their complaints I should prefer to die from.

Whenever the butler or the maid approached the door I wondered: "Is this to show me in or to kick me out?" Many a time I have waited until my turn had come, and then the doctor has been called out, and I have had it all to go through again—"Call again in the evening," or "to-morrow morning," and so on. But when at last the psychological moment arrived, and I was shown into the presence, I can assure you I had to make the most of it. It required some courage then to beard a Harley Street physician in his den on the subject of gas-fires, *especially when he was expecting a possible patient*, and the greatest diplomacy was required. Every moment was golden; and one realized that if one failed, such a chance might never occur again.

Here let me say that throughout my experience I have found that doctors are mostly very courteous if one can get to see them, and that they have been against gas heating simply because they honestly believed that it was not healthful in use. If one can only succeed in inducing any one of them to give a trial to a gas-fire, and then see to it that he has a good one, properly fixed, he will readily admit that we have proved our case, and will recommend his fellow practitioners, his patients, and his friends to follow his example, and have one or more installed. We have had ample and repeated proof of this.

During the month of February, 1908, I met with such gratifying success—getting 81 satisfactory results of all sorts, either installing new fires or else overhauling or exchanging bad ones—that the Company determined to recommence the campaign in the next autumn. We have continued it ever since, sending out letters to every doctor each autumn, and, where no reply is received, a follow-up letter early in December.

The Personal Address.

These are naturally as much like personal letters as possible, and great care is taken that the correct one goes to each doctor. We, of course, write differently worded letters after the doctors have had fires fixed or overhauled by us, asking whether we have given satisfaction and also whether we may fix *more* fires. We are also careful that the doctor's correct qualifications appear on both the letter and envelope, as he would rightly object to—and be less interested in—a firm that did not value his opinion sufficiently to know who and what he was. Our great effort is so to design and deliver the letter that *we at least get it read*.

With all our letters we enclose a stamped addressed postcard for reply; and this stamped postcard leads to our receiving many replies that otherwise we should never get. As at first we found that many cards came back with sarcastic or nasty remarks, with no name or address given, we instituted a system which identifies each card even should no communication whatever appear on it; and I may say that we have obtained orders from doctors and others when *absolutely blank* reply postcards have been received. In such a case, one calls and asks to see the doctor, then explains to him that we are afraid he intended to write to us about an escape, or some complaint, or possibly to fix a fire, &c., and that the postcard had inadvertently got into his box for letters to post. At the least this gives a chance to talk; and if one can only get this, there is great hope.

Results "After Many Days."

Other valuable points in this identification system are rapidity in dealing with the hundreds of replies received, many of them with what one may perhaps be excused for calling their "Latin" or "Prescription" signatures and addresses; and, in addition to this, we know who are against us, and "forewarned is forearmed." A significant feature is that we receive postcards years after they were sent out—indicating that our letters are read and put carefully by for future consideration, which is what we want. We keep a card system, and have a special staff who deal with the replies received, and call on as many as possible who do not reply or else reply unfavourably.

Before quoting figures of results attained year by year to date, I should like to say a few words as to some experiences met with. I may say I was appalled in the early days at the terrible samples of gas-fires in use in certain doctors' houses, and could not wonder at their users being against gas heating. I found that nearly every doctor I interviewed who used gas-fires said that he did so for their convenience and no other reason, and that he objected to them on the score of appearance, economy, and hygiene. Mostly one found the fires that were in use were in waiting rooms (that the doctor did not sit in himself) or else in consulting rooms, solely for convenience, and these would be used as little as possible. It was very unusual to find them fixed in bedrooms.

Fires in Consulting Rooms.

I have sat in waiting rooms and looked at gas-fires so bad that they were enough to finish off any sick person, and I have found similar specimens in consulting rooms. But we have changed all that; and now patients see in most doctors' rooms, cheerful, hygienic gas-fires burning, which make them feel better at once. If men, they go away determined to have one or more fixed at home; if ladies, to give husband or father no peace until they have some in use.

We have found gas-fires fixed to dummy chimneys, and have been told by the doctor that gas-fires smelt! One we found fixed in a position where an alcove for a statue had stood. This had been bricked across the front, a gas-fire stood against it, and ventilated into it, with the usual result—"stinking gas-fire," &c. Another case. A doctor was found to have in use in two rooms exactly similar fires as follows: The actual grate was empty; a piece of sheet iron was put across the top of the bars, and a grate burner stood on this with a shovelful or so of ball-fuel thrown on. But this is not the worst. The grate register had been removed, and a piece of sheet iron substituted, entirely closing the opening; and the doctor condemned gas-fires because they smelt! One of these excellent examples of the art of how not to do it, was actually in his children's bedroom.

Travesties of Gas-Fires.

Yet another case. We received a reply that the doctor *did* use gas-fires, but found them much as he had found all such fires, and after a few hours the air of the room got oppressive, &c. I called, and was told that one of these fires was used upstairs, and he asked his wife to show me into the drawing room. I was shown an empty grate, with a piece of ¼-inch compo and ⅜-inch fan cock, with a flexible tube nozzle at the side of the fireplace. I asked where the fire was, and the lady fetched it in. It was a wrong sized and wrong shaped grate burner; and it appeared that when any friends came who liked a gas-fire, the lady trotted it out, stuck it in the grate, attached a flexible tube, threw on a shovelful of ball fuel, and there was a fine specimen of a fire to recommend gas heating. But when any friend came who did not like the gas-fire, it was kept discreetly in the background. I said: "Are there *many* of your friends who like the fire?" She said: "Not many." And I quite believed her. I endeavoured to obtain permission to fix a proper fire, but at first met with the reply, "But I can't take it out when my friends who don't like a gas-fire come to see me." I assured the lady that all her friends would like the fire that I should fix; and I am glad to say that this doctor is now a satisfied user of gas-fires.

A Warm Reception.

Just one more experience. I have, of course, met with some warm receptions, strong language having been used, though I must say that this has not been very frequent. A doctor once replied that he did not want anything from us, and stated that this was *final*. Mr. Goodenough instructed me to have one more try at him, and wrote asking him to give me two minutes if I called the next day at a certain time. I went and was shown into a waiting-room, with patients waiting. I heard a door shut at the end of a long passage, and somebody take it in three strides. I thought "I am in for it," and I was. An irate-looking man flung the door open and said, "Here, you." I felt that he meant me, and I went. My progress to the street door was fairly rapid; he being in such a rage that he seemed scarcely able to speak. I asked him as quickly as I could whether he had anything against *modern* gas-fires; and he replied: "Yes, he had seen some recently, at his mother-in-law's," and I was wasting my time and his. And I found myself in the street with the door shut. I am afraid his reason for being against gas-fires must still be in existence, as we have not yet had the pleasure of supplying him.

I think I can truly say that we have conquered some hundreds of down-draughts and sluggish chimneys, and that this alone has gone far to convert men who were previously antagonistic to the use of gas-fires. That is to say, we have proved to them that it is possible to fix a gas-fire giving perfect satisfaction, to chimneys where it has been impossible, from the hygienic point of view, or with any degree of comfort, to use coal-fires.

The following figures indicate the number of doctors we have approached, and the results obtained year by year to date, with the exception of the first year, for which no trustworthy figures are available.

We usually receive about 28 per cent. of replies from the total number of letters posted to all the doctors, including those who are using gas-fires and who are on our register for periodical inspection, and about 20 per cent. of replies from those who are not known to be using gas-fires. Of course, many of the replies from those whom we have already dealt with are testimonials, and many of the replies from those who are not known to be using fires are not by any means direct requests to fix fires; but, judiciously dealt with, they lead to business. In addition to the fires and heaters fixed by us, a number have been fixed by private fitters; and, owing either to a reply by the doctor to one of our letters, or to an inquiring call being made by one of our staff, these stoves have been subsequently overhauled or refixed by us, and added to our register for periodical inspection.

Season.	Fires and Heaters Fixed.			Fires and Heaters Overhauled.	Fires and Heaters Exchanged.	Doctors known to be "Using Gas for Heating" at End of the Season.	Possible Total per Medical Directory.	Percentage known to be "Using Gas for Heating" out of the Possible Total.
	Sold.	Hired.	Total.					
								Per Cent.
1907–8*	..	..	..	..	..	..	..	..
1908–9	160	262	422	1,417	110	1,054	3,620	29
1909–10	200	612	812	2,590	202	1,844	3,630	50
1910–11	280	660	940	3,850	180	2,205	3,814	57
1911–12	308	700	1,008	6,060	190	2,484	4,012	62

* No trustworthy figures available.

Gas-Fires in Nurseries.

A notable feature in connection with the figures quoted is the large number of fires that we fix in the doctors' bedrooms and their children's day and night nurseries. I hope I shall not be considered as overstating the case, if I say that these figures are very good ones; and that they indicate a remarkable reversion of feeling towards gas heating in the minds of those members of the medical profession whom we have dealt with, because a majority of them now as strongly support and even advocate gas heating as in the past they condemned it. It is quite evident, however, that our task is not by any means complete, as it will be noticed that we have still 1528 doctors who are *not* known to be using gas-fires. It will be appreciated that as the figures decrease, they must include the most obdurate, or those who for some other reason have not yet succumbed to our blandishments. It is worth remarking, too, that apart from *increasing* our number and percentage of users of gas for heating, we have to work to *retain* the figures we have reached.

For instance, at the commencement of each autumn we have some hundred or so less doctors using gas-fires, owing to removals, deaths, &c., during the summer. Most of those who remove to another address within our area we retain as users of gas for heating, fixing fires for them at their new residences; but, in the case of death or removal out of our area, we have of course lost them altogether, and our numbers are reduced accordingly. The new practitioners succeeding them, who may be starting a practice for the first time, or have removed from some other district, may not for the moment trouble about gas heating. Before increasing our numbers, therefore, we have each season to make good the inevitable losses that must arise owing to these causes. It is interesting to note, in connection with this, that each year we have to sort out from the "Medical Directory" more than 500 names and addresses of doctors who have removed, died, or gone out of practice, &c., and also over 300 absolutely new practitioners, to attack with our letters and calls. The names and addresses on our cards, therefore, change to the extent of over 800 each season. It is obvious that they need careful watching to keep them up to date; and unless they *are* kept up to date, it is certain that the whole system must fall to pieces.

The Value of the Campaign.

I believe we have done some service to other undertakings in carrying out this work, as when a doctor who has been convinced by us, and has been a satisfied consumer of gas for heating purposes, leaves us for another gas undertaking's sphere of action, he is already a prospective user of gas for heating at the new address. Of course, the same applies when similarly convinced customers move into our area from another. But if the new comer is unconvinced or is antagonistic, he is, of course, a source of danger until he is converted.

I think this specialized dealing with hygienists and scientists might well be universally applied, so that wherever they practise or reside, or to whatever district they remove, they would meet with the same insistent but respectful request that they will give gas heating a trial *on its merits* —the fixing cost being borne by the gas undertaking; and that they will permit the free periodical inspection of their gas appliances. It would obviously be far better for the industry as a whole if such united efforts to convince and satisfy these very important customers were made.

Though the figures are so good, they cannot indicate the number of splendid individual cases we have dealt with. I mean by this, cases where year after year a negative or unsatisfactory reply has been received, and at last we have been successful in fixing one or more fires—cases where a doctor has been absolutely antagonistic to gas-fires, and advised patients against their use, but has at last been convinced, and now advises in their favour. Two instances I will quote.

A Convert.

I heard from one of our offices that a doctor had refused to allow a gas-fire purchased from us to be fixed in a patient's bedroom. I called on him, ostensibly to see whether he had any gas-fires in use; and after a prolonged discussion I succeeded in getting permission to fix one in his own bedroom. We subsequently received a postcard from him bearing the following words: "You have converted me." I shortly afterwards heard from our District Office that two gas-fires had been fixed for a lady on his recommendation. The ultimate value of such a success cannot easily be calculated.

A Real Triumph.

In January, 1908, in reply to one of our letters, we received a postcard from a doctor of standing who did not use gas-fires, advising us of his conviction that they were bad, and that until convinced to the contrary he would make it his business to prevent patients using gas for heating. Mr. Goodenough called on him personally, and had a long discussion with him, in the course of which he mentioned that he had only recently turned thirteen gas-fires out of one house in the Brentford Company's district. Nevertheless, Mr. Goodenough almost succeeded in obtaining permission to fix a fire on trial. On various subsequent occasions one or other of us interviewed him; but, in spite of all our efforts, for a long time we failed to obtain the desired result. We continued, however, to send our letters to him twice a year; and in October, 1911, he replied on one of our postcards that he had some gas-fires at a new residence he had taken, and his experience was unfavourable. I called and dealt with the fires, with the result that, though the keenest of keen critics, he is now a satisfied user of ten fires at his residence. In addition to this, I succeeded in inducing him to allow me to fix fires at his consulting rooms in the City, entirely displacing coal. This alone was worth having, as the gas-fires are used continuously from 10 till 4 each day when the temperature warrants it. But, in addition to this, he was good enough to show them to others in the building; and, owing to this, one firm installed gas for heating their offices entirely, and others gave smaller orders.

After extended trial at residence and consulting rooms, he wrote us the following letter which has already appeared in the "Bulletin," but is worth reproducing here. The wording goes to prove that the doctor only became convinced after extremely careful consideration had been given to the subject.

> Dear Sir,—After all the trouble taken by your representative, Mr. Creasey, to satisfy me, I should be ungrateful if I did not express my satisfaction.
>
> As I told you before the work was undertaken, I was by no means in favour of gas-fires; and I still see in other houses gas-fires which are obviously unsanitary.
>
> But I am more than satisfied with those installed in my private house, ten in number, and two in my consulting rooms. It may be of use to you to quote my experience. Not one of these fires gives the slightest smell, and careful tests show that no burnt gas escapes into the rooms. We have had no complaints of headaches or sleepiness all through the recent cold snap, when the fires were busily burning. The absence of dust from the rooms is much remarked; and the economy in labour is good. Gas undeniably costs more per hour than coal; but when the wages of a servant, to say nothing of her keep, are set off, the balance is much in favour of gas.
>
> In a sick room the gas-fire is noiseless, dustless, and the heat can be graduated to a nicety. I suggest, however, that for bedrooms it would be well to divide the groups of burners, so that only one-third of the fire may be used as a rule. The present burners light up rather more than half the fire at "half on."
>
> To those who sit up late reading, the gas is a great advantage, as it needs no attention, and instead of going chilly to bed, having sat over the dying embers, I turn the gas full on and have a good warm-up the last thing.
>
> The amount of heat given out is of course uniform. In this, one does sometimes miss the roar and blaze of the coal fire, which can be procured at will, but it seems to me that the general atmosphere of the room is warmer where a gas-fire has been burning than where a big coal fire has made the centre of the room very hot. It may be a matter of contrast.
>
> There is, however, a big "but." I must warn any who think of adopting gas-fires that they must insist that only the gas company's own men shall set them up. I thoroughly realized the importance of this when I compared the work done in my house with that done by "local ironmongers." It is a skilled job.
>
> I would say—"Get the gas company to do the work, and pay a small sum for periodical inspection." This inspection is important, because servants will now and then dislodge the fuel.
>
> You are welcome to quote this letter, but my name must not be published. To a limited extent also I should not object to letting people see the fires at work in my house.

Our position as regards the extension of gas heating must inevitably be strengthened by the good (instead of bad) opinion of such a man. His son, who takes his degrees this year, and becomes a doctor, has also watched the fires, having one in use in his bedroom. He starts his profes-

sional career already satisfied (I could almost say enthusiastic) as to the hygienic value of gas for heating.

Keen Critics Convinced.

We have fixed gas-fires in the offices and council room of the "Society of Medical Officers of Health," London. Before we had the pleasure of doing this, I had to appear before their Committee, who made it perfectly clear to me that anything they installed or used must be, "like Cæsar's wife, above suspicion," and that our fires must be absolutely hygienic or they would come out. They are the keenest critics I have met; but I am glad to say that since then additional fires have been fixed for them, and I have succeeded in displacing electricity for lighting their council and exhibition rooms.

We have also fixed gas-fires in the homes of several medical officers of health, in some cases in their bedrooms. After improving a previously unsatisfactory fire at his residence and satisfying him, one of these gentlemen permitted me to fix gas-fires in his study, a bedroom, and his children's nursery. He is now Chief Medical Officer to the National Insurance Commission. Comment is surely needless.

Gas-Fires in Hospitals and Dispensaries.

Another medical officer of health recommended gas for heating a "Dispensary for the Prevention of Tuberculosis," with the result that in every room a gas-fire has been installed, and not a scrap of coal is used in the place. We have a similar dispensary with seven gas-fires installed. Would any one of us a few years ago have prophesied such a thing as a medical officer of health (and a very keen and critical one at that) recommending only gas-fires for the use of patients suffering from consumption?

Another medical officer of health to whom I wrote asking for an interview, after a discussion, allowed me to fix a heater on trial; and this led to the fixing of gas heaters in some corridors and small wards in an Isolation Hospital, where there were patients suffering from scarlet fever and diphtheria. I may add that some of these heaters displaced electric radiators.

It is worth noting that the medical officers of health are being consulted with reference to the details and appliances to be used in connection with the construction of the new Sanatoria to be built under the National Insurance Act, and are holding an exhibition at their Society offices in London, including gas appliances for lighting, heating, cooking, water heating, laboratory work, &c.

The Opinions of Specialists.

We have a number of throat specialists and physicians and surgeons of high rank on our list of satisfied users; and, as some indication of the feeling that exists between us and some of these gentlemen, may I quote the following case? An American gentleman was leasing a new hotel in the heart of the west end of London; and, after agreeing to instal gas-fires in one part of it for heating the bedrooms, &c., he cancelled the order, as he was advised by a friend that gas-fires were unhealthy, and that he would lose all his guests if he installed them. It was "up to us" to save the situation. I saw him, and assured him that over two thousand doctors used gas-fires in that part of London supplied by us alone, apart from the other companies' areas. He told me that figures "cut no ice" with him; but if I could take him to a doctor of standing in the best part of London —not a quack—who not only recommended, but *used* gas-fires, and who would interview him on the subject, he might alter his decision. If I intended to do it, however, it must be done that day, as there was no time to be lost—the hotel being due to be opened in a few days. I think it will be agreed that this was rather a tall order; but I told him it should be done. Will it be believed that within an hour I had promises to interview him from three men of standing? One of these was a throat specialist in Harley Street; and the other two were consulting surgeons, both residing in the neighbourhood where the very highest class men practise, whose fees (outside hospital practice) are naturally high. One doctor even offered to put off an appointment to see this customer for us.

I think that I surprised the American gentleman, hustler though he was, and after running him round in a taxi to two of the doctors he told me he was quite satisfied, as these men were certainly some of the best, and as one of them used nine, and the other ten, gas-fires, there was no doubt that they practised what they preached. He ordered thirty fires to start with, has now forty-four in use, and his consumption for the first year for gas heating alone was about 650,000 cubic feet.

I can assure you that these doctors did this wholly and solely from a friendly spirit, with no thought or suggestion whatever as to any personal gain attached to it, and that they pay for their gas and the rent or the purchase price of their fires just the same as ordinary customers.

Gas-Fires in Nursing Homes.

We have fixed many fires in Nursing Homes and Nurses' Institutions, the use and observation of which tend to do away with the serious prejudice against gas heating that previously existed among nurses. One lady doctor—whose husband is also in practice, and uses gas-fires at his consulting rooms at another address—has a Training College for Lady Medical Students; and in this case we have fixed no less than thirty-seven gas-fires and heaters, one in every room in the place, including lecture rooms and bedrooms. There is not a coal-fire to be found there.

Testimonials.

We have had many hundreds of postcards and letters from medical men, expressing satisfaction with our work and the use of gas for heating; and we should be very pleased to show these to anyone interested. I will quote a few extracts from the large number we received last autumn.

> "I regard gas-fires as an enormous boon, and always recommend my friends to adopt them."
>
> "I appreciate the courtesy and wisdom of your Company in giving annual attention." [This is from a doctor who is a lecturer and examiner for "First Aid" for the London County Council.]
>
> "The periodical attention now given is affording entire satisfaction; so much so, that I have advised many people to have gas-fires."
>
> "I have recommended your gas-fires to some of my friends and to many patients, and they have all said how pleased they are with them."
>
> "I think I have all the gas-fires I can get in, and am very pleased with them. I shall continue to advise their use amongst my patients."
>
> "Your gas-fires have given me entire satisfaction. They are extremely clean, give out great heat, and are very healthy. I have recommended them to several of my patients for use in the sick chamber."
>
> "They have hitherto given me entire satisfaction, and I have taken advantage of every opportunity to recommend them."

In the autumn of 1910 we started writing to doctors who attend hospitals, but have no private practice, in order to give them some knowledge of what we are doing in the way of gas heating—hoping that sooner or later, when they take up a practice, the first thing they will think of is installing gas-fires for use in waiting or consulting rooms, &c. As we have very little hope of doing business with them while at the hospital, this policy might be looked upon as a wasteful one; but I am convinced that it is not so. One particular case I will here quote. A doctor, in answer to one of these letters addressed to him at the hospital, wrote asking for further particulars, as he was taking up a practice; and the result was the installation of nine gas-fires. In addition to this, last season we extended our scheme to hospitals themselves, as these are essentially the places where gas heating—if adopted—would be brought to the notice of the doctors and medical students who are our present (and future) private practitioners, and where if bad gas-fires were in use a great deal of prejudice would naturally be instilled into their minds. You see we are really attempting to bring them up on gas heating. What we are aiming at is to ensure that the coming generation of practitioners will start out in life with as great a conviction *in favour* of gas heating, as the last generation had *against* it.

In our opinion, we have arrived at the position when, if the hygienic value of the use of gas, for not only heating, but for any and every purpose, is universally admitted, surely no other argument can be advanced against its extensive and even universal adoption. Is it not perfectly evident, therefore, that we must not only tell the hygienists and scientists that the use of gas for heating is hygienic, but prove to them that it is so? What better method can be pursued than by persuading them to adopt gas for use in their own homes and institutions?

Medical Officers of Health.

From the ranks of the medical profession spring the greatest authorities on hygiene, including the medical

officers of health, to whose central "Society" premises and London members I have already referred. Medical officers of health, in every city and town throughout the country come into contact with, and criticize, all kinds of gas appliances, either favourably or unfavourably according to their merits or demerits—or rather (let it be clearly noted) according to what these scientists' ideas and knowledge of the merits or demerits of the appliances may be. Knowing this, therefore, if we do not endeavour to get them to allow us to give them facilities for gaining the correct knowledge, our blood will be upon our own heads.

Though we have made gas heating the leading item in our campaign, we have neglected no opportunity of putting the use of gas for any and every purpose before the medical profession, and have fixed a very large number of gas cookers, and many water heaters, and have carried out a lot of lighting work.

We have also extended the scheme to qualified dentists, architects, surveyors, and estate agents; and though these gentlemen do not come within the scope of this paper, I may mention that we have met, and are meeting, with great success in these directions. I need not point out how valuable for the industry it must be for architects and surveyors to have a favourable opinion of gas heating, and I could quote instances where architects have specified for gas heating in new buildings after we have convinced them of its value from all points of view. Estate agents can also do us a lot of good; and suitably chosen, well attended gas-fires burning in their offices are likely to bring many a customer.

It is practically impossible sometimes to arrange the fixing of gas-fires for architects or surveyors at their offices, owing to the fact that these are centrally heated, or supplied with coal at so much a scuttle, under agreement with the landlord or housekeeper, and frequently the heating is included in the rent. Our offer to these gentlemen accordingly embraces their private residences, if these are within our area of supply; and as far as my opinion goes I think that the *correct* use of gas for heating their own homes is likely to do us as much service as at their offices.

We have nothing to conceal, we make no false claims, as regards gas heating; and the closer and more personal the observation, the more likely are we to obtain a convert.

A Summary.

To sum up. Our first object is to obtain a large number of extensive consumers of gas for heating, &c., among the ranks of the professions mentioned.

This, of itself, is worth having. But we have another object in view, which in my opinion is of still greater importance, and that is the converting of these customers into friends—friends who will be enthusiastic on the subject of gas heating, or the use of gas for any and every purpose, advising and instructing others accordingly; friends whose well-chosen, well-fixed, and well-attended gas-fires in waiting rooms, consulting rooms, and offices will speak for gas heating, and us, with no uncertain voice; friends whom we shall always be willing to assist in every possible way, as they have allowed us the privilege of showing them that the old prejudice which existed against gas heating is—at all events now—an unfair one.

Let it be said, however, that we have no desire—and I have said this to medical men hundreds of times—that a doctor shall say gas heating is hygienic, unless he really believes and finds it to be so; and my knowledge of the profession leads me to say that I know that they would not do this on any account. They are extremely reserved in expressing their opinions, as they naturally should be, and when they finally give it in favour of gas heating, after a careful and frequently extended personal trial, you can rest assured that they mean it.

I must mention that we have a specially chosen staff to deal with this work—men who can talk (I fancy I was first chosen on this score myself). But, in addition to this, they must know as much as possible about gas heating and other appliances, and be able to tell the fitter how to fix the fire or whatever it may be, if he does not know. It would be absolutely useless to have men who could *only* talk, or what one might call "good canvassers," because before they got very far they would be bowled-out by some wierd questions asked them, or else by being asked to fix a gas appliance in some unheard-of way.

You must have men who know what is and what is not permissible as regards methods of fixing fires, &c., and who are not afraid to say "No," respectfully but firmly, to a request to fix a fire in a manner that must ultimately bring discredit to gas heating. Far better is it to lose an order than to carry out such work as this; and I have found that if the customer be dealt with properly, one can generally get one's own way, to the ultimate satisfaction of all parties concerned. It might be said that this proves that, unless special men are used, gas heating would prove a failure. Nothing of the sort. Our motto is, "Specialists for Specialists." The ordinary customer will usually have a fire, or whatever it may be, fixed in the orthodox way (which we know after extended experience to be the correct one), with no questions asked; but the gentlemen whom we run across in our campaign amongst the doctors ask very awkward questions at times—as they should do, and are expected to do—as to the why and wherefore, and so on. If one uses one's wits, there is every chance of learning something from them; and I am not ashamed to say that at various times they have taught me something, either by what they have said, or owing to a train of thought that has been started by some awkward question they have asked.

I will conclude by stating that we do not intend to relax our efforts, and shall go on until the only doctors *not* using gas for heating are those who resemble the Scotch doctor who told me that though gas-fires were all right, he considered we were almost criminal in encouraging people to use fires of any sort in their bedrooms, and for his part he never needed a fire at all. It is fortunate, however, for the welfare and the future of our industry that by far the greater number of our customers—including members of the medical profession—are not so Spartan as this worthy gentleman.

Discussion.

Mr. Douglas H. Helps (Reading): I have very much pleasure in complying with the request to propose a vote of thanks to Mr. Creasey for the most excellent paper he has given us. I am sure it will be of great value to the industry. It increases the indebtedness of the whole industry to the Gaslight and Coke Company for the work they have done in dispelling the prejudices against gas. Some four or five years ago, I was in the presence of some doctors who were discussing the question of ventilation. One of them remarked that he would never allow a gas-fire in a bedroom. I asked him why. He said a gas fire eats up the oxygen in a bedroom. I said, surely it must get the air from somewhere. He said No; it creates a partial vacuum in the room. Now if a well-known practitioner has an idea like that, surely it follows that the formation of this Society has been none too early. In a pamphlet I have here, there is a certain Dr. Carpenter, who states that one should never have a gas-burner in a nursery, because gas in burning gives off quantities of sulphuretted hydrogen. We all know that this is quite impossible; but he goes on to say: "Well I know that baneful product poisoning all members of the animal and vegetable kingdom." I think the best reply to that remark is that at the Zoological Gardens, in the rare birds house, I found gas-burners were in use. I questioned the attendant, who told me that since these gas-burners had been put into the house, which was one containing the most delicate birds, the life of the birds had doubled. I wrote to the Curator of the Gardens; and he confirmed what the attendant had told me. If we were to believe all the statements that have been made, surely our race would be nearly extinct. But I find that in the Sixteenth Century the average rate of life in Western Europe was from 18 to 20 years, whereas at the present time the average length is 40 to 50. Again, in London in the Seventeenth Century the death rate was 50 per thousand of the population, whereas now it is under 15. My confidence in the industry lies in this, that the more this question is investigated by scientists, and the more the truth is known the better for the industry. I have pleasure in proposing a vote of thanks to Mr. Creasey, who is not only indefatigable, but irrepressible.

Mr. A. E. Broadberry (Tottenham): Mr. President, I have very much pleasure in seconding the vote of thanks to Mr. Creasey for his admirable paper. I wish to congratulate him on the breezy and refreshing style in which it has been written. It has been entertaining as well as being instructive to us all. I also wish to congratulate him on the work that he has been doing in the district of the Gaslight and Coke Company. The effect of the work I can assure you is very widespread. It is not confined to the district of the Gaslight and Coke Company, because our Tottenham and Edmonton district comes in contact with the boundary of the Gaslight and Coke Company for a considerable distance; and we in Tottenham have felt the effect

of this work being carried on in the district of the Gaslight and Coke Company to such an extent, that we felt we were compelled to follow up the system ourselves. We could instance doctors who sometimes have occasion to move from the district of the Gaslight and Coke Company to our district, or else doctors in our district who have heard something about it from friends of theirs in the district of the Gaslight and Coke Company, and who quite expected to have the same attention. We, therefore, have not only copied the system, but we have borrowed all the information and hints from Mr. Goodenough, who was kind enough to give us the details of the system that he has so successfully introduced. There is the very remarkable testimony of one doctor whom Mr. Creasey referred to—a doctor who used to be very much averse to the use of gas-fires—and I should like to add my testimony to that particular case. I knew the doctor very well indeed. He was a very well-known practitioner in Tottenham. I have had a good many conversations with him at different times; and I know what his prejudice was against gas heating generally. I heartily congratulate Mr. Creasey at being able to break down that prejudice, and to make him such an enthusiastic convert. I believe he is typical of many other doctors, and that they are now only anxious to appreciate the great value that gas will be to them in their profession, not only for heating their consulting rooms, but to ensure the provision of hot water in case of sickness, and keeping the temperature of the sick-room nice and even according to the requirements of the illness. In regard to this matter, I have in my possession a testimonial from one of our consumers, who says that on the recommendation of the doctor he put a gas-fire into the bedroom of one of his children who was very ill, and that he attributes the saving of the life of his child to the existence of the gas-fire. I am sure we shall all of us do well to carry on this system of assisting the medical profession to find out the great value of gas in such cases as these; and I think we are all of us called upon to copy the example that has been so well set us by Mr. Creasey. I can heartily congratulate him on the work that he has done.

Mr. George Helps (Nuneaton): Mr. President and gentlemen, in addition to this paper being one of the brightest I have ever listened to, it is one of the most convincing. On the face of it, it is a record of work done, and the note it opens with is the note that this Conference opens with, and one I hope it will close with. The spreading of truth and light about our industry and the dispelling of old prejudices is the principal aim of the British Commercial Gas Association. If that is the note we intend to sound, there will be no difficulty whatever about our obtaining all the money and backing we require. I do not speak the truth as a moralist, because I am not one; I am a commercial man. The establishment of fact is all that we want; and if we establish the facts, we are bound to meet with the success which we all deserve.

Mr. Fred. A. Pye (Chester): Sir, I should like to have an opportunity of expressing my gratitude to Mr. Creasey for his excellent paper. During the delivery of his speech, it occurred to me that he admonished some of the hesitation that provincial undertakings felt in joining the Association. I confess that we in Chester were not free from that hesitation, because it appeared to us likely that the London companies would benefit out of all proportion from their large scheme of advertising, in the Society papers in particular. But I realize very much more fully now that if it be a fact that you can benefit by advertising in the Society papers more largely than Provincial gas companies, you will also have opportunities and obligations in meeting the leaders of scientific research, doctors and professional men which no provincial man has a proprotionate opportunity of doing; and I think that work done of this character is one of the most excellent arguments in favour of the support of the Commercial Association by the whole country. I cannot say much about gas-fires. We have had now 25 years' experience of fires of a sort; but we have started this organization at a most excellent period. As Professor Lewes pointed out last night, we benefit more by radiant heat than any amount of convected heat, and it is really during the past two or three years that the attention of the makers has been addressed to the manufacture of gas-fires giving out a large percentage of radiant heat. Our many failures in the past have been largely due to a deficiency in radiant heat; and now if the doctors are persuaded that they can secure benefits for their patients from gas companies, who have a very large selection of gas-fires which can be fixed without any of the annoyance of attempting to check failing draughts with sheet-iron as we used to do, we shall have achieved a great thing. I do not know if I understood the President rightly just now when I gathered that he hesitated as to the advisability of scrapping a large number of old pattern gas-fires.

The President: No.

Mr. Pye: I thought you did refer to it as being a difficulty.

The President: A difficulty, yes.

Mr. Pye: It does appear to me that the old fires are really detrimental to us in developing our business. If we were, at a nominal cost, to offer to exchange the old fires for a new pattern fire for our customers, we should probably not only secure a much more continual use by the consumers, but it is not unreasonable to think that, owing to their appreciation of the attention received, and great satisfaction with the result of the fire, we shall secure two or three additional consumers by one consumer's influence. There is just one other matter that I want to refer to, and that is the question of inspection. I have found in the last two or three years that on going to consumers' premises our inspectors have discovered a very large number of fires in such a condition as to be incapable of yielding satisfactory results; and I have reaped a very great advantage in the last two or three years by sending inspectors out early in the autumn on house-to-house and shop-to-shop canvass, offering to overhaul and clean the stoves free of charge. In the spring I do the same thing with the cookers. It has not been a very costly matter. A large number of gas consumers we know object to pay even a small charge, and rather than quarrel with them there is always a temptation to allow it. I faced the matter straight out by not making any charge to anybody at all; and I am afraid that our development will have to be on the lines of the price charged for gas including the charge for installation and attention on the consumer's premises. The extra additional cost will certainly not be very much.

Mr. Goodenough: Our time is so valuable that I will not occupy more than a very small portion of it; but I should like to add my congratulations to those of the other speakers to Mr. Creasey for his paper, which is only an average sample of the work that he does for the Gaslight and Coke Company. I should like to mention one or two excellent results that we have already obtained in the first week of our starting this season's work. We have fixed several fires for the Lecturer on Hygiene at Bedford College, four fires for an Assistant Lecturer of the University of London, and a fire for a doctor who had been approached from 1906 without success. One doctor writes a letter to us, in which he says, "The use of gas-fires in bedrooms has cost me a fortune in diminished fees," and yet he says he is continually recommending them to his patients. There is one point I want to emphasize, and it was really the particular point I got up to speak on. It is that it is no use instituting any campaign among medical men or any other scientists unless you take care that your gas-fires are properly fixed, and that, when they have been fixed, they are kept in proper order. No amount of publicity or canvassing is any good unless it is backed-up by good service, which in the case of gas-fires means good fixing and good overhauling.

The President: I am very sorry, gentlemen, but our time is now exhausted. We must hear a word or two from Mr. Creasey in closing the discussion. I confess when I saw the paper first, I was a little shocked at its length; but I do not think that any of us have felt it was too long. It seems to me that it is a paper on very correct lines. It is a friendly statement on the part of one gas company in regard to the work that it has had the opportunity of doing which we hope will be for the general good. The atmosphere of these meetings throughout has been so entirely cordial, friendly, and intimate that I think this last paper of the Conference is quite in keeping with the general atmosphere. I will now ask Mr. Creasey to reply.

Mr. H. H. Creasey: Mr. President, ladies, and gentlemen, I feel very gratified at the way you have received my paper. I must confess, as Mr. Corbet Woodall has said, that I was very nervous about the length of it. I tried all I could to see if I could cut it down; but, as a fact, I should like to have said much more about it. I shall not deal with any of the remarks that have been made other than the question as to maintenance, and there I am wholeheartedly with the gentleman who says that he thinks that

all gas-fires should be maintained. My creed is "Maintenance." Unless you do maintain the appliances, it is not a scrap of good sending them out. In regard to the success of our campaign, I am sure you will all realize, as I do, that it would not have been possible for this canvass to have been carried out so well, or even at all, had it not been for the hearty support that had been given to it by Mr. Corbet Woodall and the Court of Directors. That support, in conjunction with Mr. Goodenough's cheery optimism, the confidence of the men working under him, and their great interest in the work have at all times led us on to successes that have seemed impossible of attainment. With these few words, I thank you, gentlemen, very heartily for the way you have accepted my paper.

THE HYGIENIC ASPECTS OF GAS FOR HEATING AND LIGHTING IN HOME, SCHOOL, AND WORKSHOP.

A Lecture by Professor VIVIAN B. LEWES, F.C.S., F.I.C.

From the earliest days in which it was realized that there was an atmosphere around us, it has proved itself not only a happy hunting-ground for the investigator, but also a battlefield for the scientists of all periods. Three hundred and sixty years before the birth of Christ, Aristotle, noticing the work which air in motion would do, came to the conclusion that it must have weight, and attempted to ascertain if this were so by weighing an ox-bladder from which all air had been expelled, blowing it full of air, and again weighing it, when his scales showed a slight increase. No sooner, however, had his experiment been made public, than Simplicius at once pointed out that Aristotle had used the air from his lungs, and that if ordinary air was pumped in from a bellows, no increase in weight took place. This controversy was the first and the last for twenty centuries; and it was not until Galileo, in the middle of the Seventeenth Century, made his celebrated experiment of compressing air into a brass globe that the weight of the atmosphere was established.

Constituents of Air.

Many other physical discoveries with regard to the air were made in the following century; but it was not until 1774 that the combined labours of that trinity of genins, Priestley, Cavendish, and Lavoisier, showed that air was not an element, as had always been supposed, but was, in fact, a mixture of the two great elementary gases, oxygen and nitrogen. It was at this period that Cavendish, devising processes for the purpose, first determined its composition, and found it apparently so unalterable that he came to the conclusion that it must be a compound; while others inclined to the belief that it was merely a mixture. It was then that the brilliant experiments of Lavoisier, on the influence of oxygen upon combustion, led to the idea that it was the percentage of oxygen present that was really the criterion of a good or bad air; while Priestley showed that growing vegetation under the influence of the sun's rays gave off oxygen. Later it was discovered that gases did not behave towards gravity in the same way as other bodies, and could not be arranged in layers, but that when a light gas was superimposed upon a heavy one the two quickly mingled. Graham, that great Master of the Mint, in the middle of the last century, having experimentally determined the rate at which the intermingling of the gases took place, enunciated his celebrated Law of Diffusion.

The presence of carbon dioxide in the air had been ascertained at much the same time as the discovery of its composition, and, further, it had been shown that the carbon dioxide given off during respiration, and by all processes of combustion in which carbonaceous material was used, was absorbed by plant life; the carbon being used to form the woody fibres and cells of growing plants, while the oxygen escaped free to revivify the air. As soon as this had been accepted, carbon dioxide was substituted for oxygen as the factor which influenced the health-giving properties or otherwise of the air.

The Carbon Dioxide Bogey.

At a somewhat later period, however, doubts began to be raised as to the injurious effect of carbon dioxide; and the statements of Sequard and D'Arsonval pointed to the fact that it was rather the organic matter which always accompanied the carbon dioxide when evolved by processes of life, that really was the injurious factor in an unventilated space, and chemical purity began to occupy the important place in the mind of the ventilating engineer. It was found, however, that the organic matter in the air was extremely difficult to estimate; and as it was always accompanied by carbon dioxide, the quantity of which could be determined readily and easily, the amount of carbon dioxide in the air was taken as the measure of its purity, not because it was itself injurious, but because, when generated by respiration or evolved through the skin, deleterious organic matter accompanied it. Pettenkofer and other observers, having made analyses of air from all parts of the world and under all conditions, found that it was always present, and existed to the extent of 0·03 to 0·04 per cent. in good air. From these facts the sanitary authorities fixed as the limit in the air of confined spaces 0·06 per cent. of carbon dioxide as being the amount to which it can be raised without injuring health when the carbon dioxide had been produced from life.

This last saving clause, however, was nearly always overlooked; and carbon dioxide has for the past thirty years been regarded as a more or less dangerous impurity by those who did not grasp the fact that it was merely the figurehead for the organic matter that accompanied it under special conditions. A large number of observers traversed the organic matter theory, and came to the conclusion that the exhalations of a healthy subject contained no poisonous matter; while at the end of the last century Kruger advanced the theory that the effect on health produced by want of ventilation was due to heat and moisture. Flügge, in 1905, came to the conclusion that temperature was the only factor that had any hygienic effect, and the health would be maintained, no matter how bad the ventilation, if the temperature of a room in which people were working did not rise above 65° Fahr., or for an ordinary living room above 70° Fahr.

Healthy Conditions of Indoor Atmosphere.

Great as were these changes in opinion as to what really constituted healthy conditions of indoor atmosphere, but little attention was paid to them in England until Dr. Haldane confirmed the fact that the organic matters thrown off from the lungs and the skin of healthy people are not deleterious to health, although, consisting as they do of germs and bacteria which easily undergo decomposition, they quickly give air a sour and unpleasant smell. Dr. Haldane and Dr. Leonard Hill have also demonstrated that the carbon dioxide, even when present in such enormously increased quantities as 3 to 4 per cent., has no effect except to deepen the breathing, while with 6 per cent. it begins to produce headaches, palpitations, sweating, and distress, and with 11 to 12 per cent. coma sets in, but does not quickly destroy life. They have also demonstrated that the oxygen in the air may be reduced to 17·5 per cent. without interfering with the ordinary functions of life, and that, in point of fact, the discomfort and oppression caused in badly ventilated rooms have nothing to do with the chemical composition of the air. So that to-day our views on ventilation are in a condition of active change, and we are coming to the conclusion that the percentages of oxygen and carbon dioxide within the limits of the quantity found in the worst ventilated rooms are immaterial, and health is dependent on temperature, moisture, and movement of air; the last-named being one of the most important factors.

The old phase of thought and knowledge with regard to our views on ventilation, which future generations may justly call the "chemical quality era," is fast passing away, and the idea that the percentage of carbon dioxide may be taken as the criterion of the effect of the air of a room on health would soon be as dead as the percentage of oxygen standard if it were not for the fact that accepted theories die hard, and that it is to the interest of some to keep the carbon dioxide skeleton dancing on its stick. The ease, however, with which carbon dioxide can be estimated makes it a very

valuable indicator, and as long as it is recognized that it is merely an index and not an active factor in destroying health, its presence will be taken advantage of in tracing air movements.

Mistaken Ideas.

There is no phase of the subject of ventilation that has received more attention, has been more dogmatized about, or more misrepresented, than the effect of artificial illuminants on the air of confined spaces. When electric lighting first became popular, the two great features that appealed to the public were that it was more convenient to press down a switch than to find a match, turn on the tap, and light the gas, and secondly, that as it abstracted nothing from the air and added nothing to it, electric light must be more healthful in a confined space.

The Sterilizing Qualities of Gas.

I remember well the first doubt that ever crossed my mind arose when lecturing in a well-known London hall, in which I had given many lectures before when it was lighted by gas sun-burners, and had never felt any oppression. On this occasion, however, the hall had just blossomed out in the full glory of electric light, and I felt it unpleasantly stuffy; while two of the audience felt faint and had to be taken out. In consequence of this, I made some experiments in a room having a capacity of 2700 cubic feet, and obtained the totally (to me) unexpected result that when the room was lighted by two Welsbach "C" gas-burners and mantles on a pendant, each consuming 4 cubic feet of gas per hour, the air at the breathing level in the room was far purer and fresher than when three 16-candle incandescent electric lamps were used; and that the result became the more markedly in favour of gas the larger the number of people in the room.

Further experiment showed that the cause of this unexpected phenomenon was that the strong uprush of heated products of combustion from the gas-burners drew up the emanations from the skin and lungs of the occupants, charred and sterilized any germs that accompanied them, and, reaching the ceiling at a temperature of 12° higher than when the electric light was employed, diffused through the plaster so rapidly as to draw fresh air into the lower portion and create a brisk draught under the door of the room, and, while so diffusing, filtered off the charred remains of germs and organic matter on the whitewashed ceiling; thus giving the blackened area which always occurs on the ceiling just above the gas light in town air, and marks the beneficent work of sterilization that the gas-flame is carrying on, and not, as the advocate of electric light always insists, imperfect combustion.

Purifying Properties of Whitewash.

Soon after these experiments had been made, Sir George Livesey commenced his celebrated attack upon the sulphur clauses. In order to prove his contention that lime purification was not essential for a domestic gas supply, he took a small house near the Old Kent Road, in which Mr. Otto Hehner and Dr. Rideal made a long research upon the influence of the sulphur in the gas upon the air of the rooms if iron purification only replaced the previous methods. These investigators found that it made no difference to the air of the room whether lime purification had been used or not; but the most startling fact was that, after burning large quantities of the gas in small rooms with the grate, doors, and windows closed, they found no more sulphur acids in the air of the room than in the atmosphere outside the house, and often less. The explanation of these facts was that the plaster and whitewash of the ceiling and walls consisted largely of calcium carbonate, and that, as the heated products of combustion escaped through them by diffusion, the sulphur acids became fixed as sulphates and sulphites of calcium; while the portion that got cooled below the temperature necessary for rapid diffusion was to a certain extent absorbed by contact with the whitewashed ceiling. As the rooms were made as air-tight as possible, the exterior air that entered to take the place of the heated products had to pass in through the plaster, and so underwent a purification that led to the sulphur in the room being sometimes less than in the open air. A convincing proof that this was the true explanation was found by varnishing the ceiling and walls, when the sulphur acids in the air increased *pro rata* with the amount of sulphur in the gas.

Gas and Air Motion.

Following up the subject, Dr. Samuel Rideal made an exhaustive research upon the "Relative Hygienic Value of Gas and Electric Lighting," which was published in the "Journal of the Royal Sanitary Institute" in 1908,* and from which he came to the conclusion that "owing to the better ventilation obtained by gas, the products of combustion are not found in the air in anything like the proportion which might be expected—the temperature and humidity in an occupied room being no greater than when the room is lit with electric light." Since these facts were first published, many experiments of this character have been made both in this country and abroad; but as far as I know not one iota of rebutting evidence has been forthcoming—all the results showing beyond doubt the importance of the heat given by the combustion of the gas in setting air in motion, promoting diffusion, and, over a given period, drawing in fresh air in so much larger a ratio than it gives off polluting products that the air in the breathing zone of a closed room is purer than with electric light, which gives off no products but has a smaller influence in creating motion of the air.

Dr. Leonard Hill, who has devoted his life to a study of the hygienics of the body, in this year's Presidential Address to the Physiological Section of the British Association, defined the conditions essential to any good system of ventilation as being: (1) Movement, coolness, and proper degree of relative moisture in the air. (2) Reduction of the mass influence of pathogenic bacteria. A stagnant atmosphere is perhaps the worst enemy to health. The body is as dependent upon the action of the skin as upon the lungs for throwing off the waste products of life, and in an hour evaporation gets rid of some 700 grains of moisture from the skin and lungs. If the air is stagnant and still, the moisture-laden emanations from the body are entangled by the clothes, and a humid layer of foul air hinders further evaporation—throwing such a strain on the system that a feeling of malaise rapidly arises; while if the air around the body is in motion and sufficiently removed from its saturation point for moisture, this blanketing of the body does not occur, and evaporation continues its beneficent work of throwing off the waste products and regulating the body temperature.

Here, then, are two of the most important factors in ventilation—movement of the air to prevent stagnation, and keeping the air sufficiently removed from its saturation point to allow proper action of the skin. As regards air movement, this may be brought about either by the natural method of air currents resulting from difference in weight of volumes of air, or by artificial methods, such as fans or blowers. The grandest illustration of the former is the creation of the trade winds by the uprush of heated and water-saturated air at the tropics, drawing in the cool and heavier air from north and south of these regions; while the overhead currents in an opposite direction, that go to restore the balance of aerial pressure, feed the rainfall, and in this way temper the climate of the northern and southern hemispheres.

If we heat air it expands, becomes lighter than the unheated air, and ascends; while cooler air takes its place, and a current or air movement is produced. Saturate air with water vapour; and as the latter is far lighter than the former, the tendency is again to ascend.

Mistaken Ideas.

There are still among us people who believe that carbon dioxide is the root of all hygienic evil, and that as it is so much heavier than air that it can be poured from one vessel to another—they believe that the forces which cause air to rise will be insufficient to cause the ascension of the products of combustion and respiration. Let me, however, remind those individuals of the old fire balloon, in which the combustion of some burning spirit on a sponge renders the products—the same as from gas—so light that not only do they ascend but carry up the weight of the balloon envelope, with a margin to spare. It is upon this power of setting air in motion and promoting diffusion that gas bases a good deal of its hygienic superiority as an illuminant; while the sterilizing effect of the flame and the trace of sulphurous acid in the products gives the reduction in organic matter and bacteria that forms the second desideratum of Dr. Leonard Hill's perfect system of ventilation.

As the amount of heat for a unit of light given by incandescent gas lighting is so far in excess of that given by the electric incandescent lamp, and as water vapour is one of the chief products of the combustion of gas, it may appear to some that the coolness and proper degree of relative

* See "Journal," Vol. CI., pp. 613, 686.

moisture insisted on by Dr. Hill can be obtained only by lighting by electricity; while Dr. Hill himself has shown that an electric fan will give the necessary movement. But apart from the cost of using extra current for a fan to complete the work of a source of light that is already dearer than gas, it must be remembered that the air under these conditions becomes so befouled with decomposing organic matter as to be unpleasant to the nose, even if not actually injurious to health; and we have no desire to live in an atmosphere having an odour of the kind that greets us when we reach the booking office of a tube station from the comparatively fresh air of the street. Certainly we rapidly get acclimatized to it, and in a few minutes our nose ceases to be worried by it. But the *esprit de corps* is still there, although electric light, electric fan, blower and pump have all been working their hardest to keep the air fresh, and there is certainly no stagnation.

The Proper Degree of Air Moisture.

The proper degree of relative moisture in the air is a question which it is not easy for the uninitiated to grasp, as it is hard to realize that a certain weight of water vapour may at one temperature saturate the air completely and render it so oppressive to live in that health is seriously affected, while a difference in temperature might make the same weight of water the right quantity for carrying on life under the best conditions. The important factor is not the amount of water vapour present per cubic foot of air, but the percentage of the amount the air is able to contain at the particular temperature. If the percentage is too high, evaporation from the body is checked; but if sufficiently removed from the point of saturation, then the functions of the body are unimpaired and health is unaffected.

In a closed room we have three sources of aqueous vapour to consider—the amount present in the outside air that is supplied to the room, the amount given off by the occupants of the room itself, and the amount contributed by the illuminants; while in a fireless room the temperature will be governed by the exterior temperature, the heat given by the bodies of the occupants, and the illuminants. The amount given by these sources other than the exterior air per hour may be tabulated approximately for from 60 to 70 candles illumination as—

	British Thermal Units.		Water Vapour.
	Gross.	Net.	
Man.	446 ..	340 ..	700 grains (Rideal)
Four cubic feet incandescent gas	2140 ..	2080 ..	1600 ,,
Three lamps, incandescent electric . .	900 ..	900	

So that, taking heat and water vapour as the factors of motion that lead to currents and diffusion, it is seen that in a room lighted by one incandescent mantle and containing two people, we have 2700 B.Th.U. and 3000 grains of water vapour to act as a motive force against 1580 B.Th.U. and 1400 grains of water vapour when electric lamps are employed. Inasmuch as neither temperature nor humidity shows any great difference at the breathing level whichever source of illumination is used, it is evident that the force has been expended on diffusion—a point made perfectly clear by the superior organic purity and carbon dioxide content of the breathing space.

I have no desire to make any invidious remarks with regard to electric lighting. There is no doubt as to its convenience and decorative value in houses built with proper regard to ventilation, in which lofty rooms, ceiling ventilators, and Tobin tubes amply safeguard the health of the inhabitants; but I do strongly protest against the methods of the electrician who attempts to displace gas as an illuminant in the homes of the large proportion (where small rooms devoid of any schemes of ventilation other than those provided by the fire-place and jerrybuilders are the rule) by false statements as to the dangers of gas, which, under these conditions, is an invaluable engine of ventilation.

The Varied Uses of Gas.

Gas fires, cookers, water-heaters, and engines have at the present time all been developed to a point which makes a consideration of their hygienic value of the greatest importance, as ever since Bunsen, in the early fifties, gave us the atmospheric burner, in which non-luminous combustion of the gas is obtained and the blackening of articles heated in the flame is avoided, gas has progressed so steadily for heat and power, as well as for lighting, that now-a-days its use for these purposes is nearly as great as for illumination.

Gas-Fires and Ventilation.

The open fire place consuming coal has always been a representation of one of our great English characteristics. Never mind its wastefulness and its polluting effects on the outer air, it is a good companion; it heats a room in the right way—that is, by radiant heat and not by convection; and the enormous volumes of air drawn up the chimney by the draught make it a valuable engine of ventilation. One of the great prejudices against the gas-fire which has always existed among sanitarians has been the supposition that its installation would do away with the ventilating effect of the open fire, and so render the air more unhealthy, and further that the cost of the gas-fire was considerably greater than that of coal.

Cost Comparison.

The last objection, which certainly is one of the most serious in hindering the adoption of gas-fires, is based largely upon fallacious methods of estimating the comparative costs of the two, as when reckoned, as is usually done, by the cost and the number of British thermal units present in a pound of coal and in a cubic foot of coal gas, the gas, roughly, would cost about five times as much as the coal for the same number of units. When, however, we take into consideration the efficiency of the grate, we find that the difference practically disappears. With a modern gas-stove we can obtain not only the warming of our rooms under conditions every whit as hygienic as with a coal-fire, but at a cost which is practically the same, as when coal is burnt in an open grate only one-fifth of the heat units present in it are conveyed to the air of the room; while with the modern gas-stove nearly four times as great an efficiency can be obtained. The balance in cost is amply made up for by the cleanliness in use, by the absence of dust and labour entailed in the supply of fuel to the coal-fire, and by the economy of lighting the fire only when it is wanted and turning it out when done with—to say nothing of the fact that it goes out only when the tap is turned off, and that the noise and effort of stoking are dispensed with.

Hygienic Claims of the Gas-Fire.

In considering the hygienic claims of the gas-stove, we must take into account, first, the way in which the heat passes from the stove to the room and its occupants. With the coal-fire this is done almost entirely by radiant heat, which does not directly raise the temperature of the air, but radiates heat to the floor, walls, and furniture, which absorb it and again slowly part with a portion of their heat to the air in contact with them; so that the walls and other solid bodies in the room are at a higher temperature than the air. There is no doubt as to this being the true method of heating. It is the way that Nature heats the world. The sun's rays beating down through the atmosphere leave it fresh and unwarmed; but as they reach solid matter, they very rapidly raise its temperature, and the solids, in turn, by convection gradually warm the air.

Apart from its being much more healthy to breathe cool than hot air, there is another important point to consider. The normal temperature of the body is 98° Fahr.; and this temperature is maintained by the slow combustion processes going on in the body. By the laws of radiation, a heated surface parts with its heat more or less rapidly, according to the temperature of the surrounding bodies; so that if a person be sitting in a room filled with warm air, but near to a wall colder than the air, his body will rapidly part with heat by radiation to the wall, and a sensation of chill is the result. With the open fire this is never the case, as the radiant heat from the fire heats the walls of the room to a temperature higher than that of the air.

When, however, a room is heated by hot-water pipes, steam, or any of the central methods of heating now so popular, the temperature is raised by convection—that is, the air in contact with the heating surface is raised in temperature, expands, and so sets up convection currents, this taking place until the whole of the air in the building is raised to a given temperature. Heating of this kind, however, always suffers from the drawback that the air is hotter than the walls and other solid bodies; so that although a room may feel oppressively hot, a chill may easily result from the body radiating heat to the walls.

Superiority of Gas-Fire over Coal-Fire.

In the best forms of gas-fire, the burning gas heats radiating material in such a way that a very large percentage of the heat of the gas is converted into radiant heat, and

passes into the room in the same way that the heat from a clear coal-fire does; while the convection heat, which used to be the chief source of the heat of the gas-fire, has been reduced to a minimum. The efficiency of the stoves has been so increased that over 60 per cent. of the total heat in the gas is utilized; so that, in heating effect, the gas-stove is far superior to the coal-fire.

The mistake was made in the early days of the gas-stove of completely filling up the space between the exit flue and the fireplace, so that all the air from the room had to be drawn through the radiant mass in the grate—this leading not only to diminished temperature, but also to a decrease in the amount of air withdrawn from the room. If, however, the flue of the gas-stove be carried some little distance up the chimney, and a space be left around it, this will act as the injector of the bunsen burner, and withdraw from the room nearly as large a volume of air as the open fire does; while the cooling effect of the gases and air upon the radiant material is avoided.

Probably the most valuable work on the hygienic aspect of gas heating and lighting is to be found in some work done by Dr. F. S. Toogood on the ventilation of the wards of the Lewisham Infirmary,* in which he carefully compared the condition of the air in a ward heated by gas fires and illuminated by incandescent burners with that of a ward heated by open coal-fires and without artificial illumination. He proved conclusively not only that gas consumed in modern incandescent burners can be used for lighting without any detriment to health, but that, in fact, it assisted ventilation by the increased circulation of the air, and that a gas-fire, properly constructed and fixed, not only does not vitiate the air, but is a valuable adjunct to the ventilation of the room, apart from its manifest advantages in reliability, avoidance of noise, freedom from dust, and economy in use.

His work is of very great interest, as he compares the percentage of humidity in a ward lighted by incandescent burners with one in which there was no artificial illumination, and in which the air was warmed by an open coal-fire, and found that in both cases the humidity of the air in the room was something like 20 per cent. less than in the exterior air.

With the old forms of gas-stove, in which the mistake was made of trying to utilize most of the heat value of the gas by causing it to heat air, which by convection raised the temperature of the air and not of the solids in the room, the percentage of humidity was so decreased that it caused rapid evaporation from plants and the occupants of the room—producing drooping in the former and discomfort, dry lips and smarting eyes in the latter—and the cry that gas heating "dried the air" was raised against its use, while bowls and saucers of water were often placed in front of the stove to add water vapour to the air, and so decrease the discomfort.

The cause of this trouble disappeared when once it was recognized that radiant heat was the only true and hygienic method of heating; and in the modern gas-stove the amount of radiant heat has been increased to the maximum attainable, and convection plays a very small part.

* See "JOURNAL," Vol. CXIII., p. 512.

Where Convected Heat may be Used.

While, with justice, we condemn utterly all systems of heating which raise the temperature of the air by convection alone, we must not lose sight of the fact that when rooms or halls of large cubical content have to be warmed convection, which as a chief or primary source of heating should never be used, may yet play a very useful role as a secondary adjunct to radiant heat. Where convected heat is used as a sole method of heating, the air has to be raised to a high temperature to ensure its carrying the heat over a large area; and this excessive heating makes it so hungry for moisture that the discomforts incidental to the old gas-stove are reproduced, and we have conditions of the most unhygienic character, while for raising the temperature of the air of a large space two or three degrees, to aid and hasten the effect of radiant heat, what I may call "low temperature convection" is often of the greatest value.

Take, for example, a large school room on a cold winter's day. No single gas or coal fire could supply the radiant heat to warm the whole room to the right degree before it was occupied in the morning; but if radiators—so called because they give nothing but convected heat—are fixed in two or more places below the windows, they will give the air the two or three degrees necessary to enable the radiant heat of the gas-fire to quickly complete its work of raising the temperature of the solids in the room, and yet in no way will detract from the hygienic conditions. For such a purpose, gas-heated steam or hot-water radiators answer perfectly well.

In a climate such as ours, in which we often run the gauntlet of the four seasons in twenty-four hours, the ease and quickness with which a gas-heating system of the right type can be brought into play is no small asset in its favour; and although in the abstract we may be willing to accept Dr. Leonard Hill's dictum that cold and hunger are thoroughly hygienic, we also feel that, unless specially trained to enjoy them, a middle course is the best for us individually.

Concluding Remarks.

I think I have said enough to show that coal gas as now used in the incandescent burner and modern gas-fire is by far the most hygienic illuminating and heating agent that we possess for rich and poor alike, and that the dwelling house, school, and workshop are all rendered more healthy by its action; while the change that has taken place in the atmosphere of our large towns during the past ten years—the lessening of smoke, the rarity of bad fogs, and the increase in the hours during which the sky can be seen—bear eloquent testimony to the work already done by the partial displacement of the coal-fire by the gas-stove in helping to rid the country of the smoke curse.

THE SCIENCE OF BUILDING ANY BUSINESS.

A Lecture by A. F. SHELDON.

The first recorded injunction of the Creator is probably the one which reads "Let there be light!" Possibly no body of men ever assembled in the United Kingdom more thoroughly exemplified this Divine injunction than does the one in convention now assembled. Verily it is your wish that there be light in every home, shop, office, factory, mine, farmhouse, street—everywhere throughout the length and the breadth of the land where it can be of service. Your prayer, your injunction to your subordinates, is like that of the Creator in the beginning, "Let there be light," only you choose to add, yea, even gas light—and ever and anon more of it. Yours is a very useful calling.

At this point, I am reminded of a story which relates to light. The members of a Society of Coloured Brethren once held a lengthy debate upon the theme, "Which is the more useful, the Sun or the Moon?" The question was argued at great length *pro* and *con*, and finally submitted to the Judge for final decision. He reviewed the arguments, and then stated as follows: "De Court has listened to de arguments of all de disputaters on both sides of de question, and now decides in favour of de moon, but for a reason not advanced by de moon advocate. De main reason why de moon is more useful dan de sun has been entirely overlooked. De sun shines by day when we don't need no light, but de moon shines by night when we sure do need it much." The reasoning of the coloured Judge makes your vocation, gentlemen, more useful than even the sun.

But to be serious. I understand that this is the first meeting of your Society. As one whose privilege it has been to witness the evolution of many associations, and the beneficial results flowing therefrom, let me congratulate you, and also respectfully offer my thanks for the honour of being permitted to be present at this, your first general meeting. Such associations, wherein men with allied interests unite to help one another, constitute one of the signs of the times—one of the evidences of the evolution of the race to a higher plane of consciousness than was that where trade was deemed ignoble, and competition was equivalent almost to enmity. You, by your very act of meeting, proclaim that you believe there is more of efficacy in co-operation than in competition. This is a scientific truth well illustrated throughout Nature.

Until recently, it was supposed by students of evolution that in the lower realms of life it was the fiercest, strongest, and most selfish which survived the best. Recent observations have proved the old theory false. It is those forms of life which co-operate best which last the longest and produce the most. As illustration: If two panthers (members of the cat tribe) are travelling native haunts and danger appears to one, he will selfishly slink away, giving no warning to his brother; whereas if a herd of fifty deer is feeding on the plain, each in reality has one hundred eyes, for each of the others is a sentinel for all the rest; and scenting danger they all fight or flee together. The selfish panther is rapidly becoming extinct. The co-operative deer tribe is increasing in numbers. The moral is evident, and may well be heeded by business men.

And now to my theme. I am to have the honour of addressing you this afternoon on "The Science of Salesmanship." This, I believe, is the subject as printed on the programme. I would crave one indulgence on the part of your honourable body—that of slightly changing the title of my theme. My belief is that I can render you a greater service if permitted to modify the title and make it read "The Science of Building any Business"—promising you, however, that our consideration of the concept salesmanship shall, by reason of this change of title, be in no wise slighted; for salesmanship, as we shall see, is the very life blood of business building, and it shall have as complete consideration as the time at our command permits.

Let us begin our consideration of this theme by an analysis of the various words used in its title. First of all, What is science? In the words of Herbert Spencer, science is organized knowledge. A very practical American has defined it as classified common sense. Science requires two things. First, accurate knowledge, in the form of tested truth, and, secondly, organization of that knowledge. There was a time when there was no science of astronomy—just a mass of confused facts about the heavenly bodies known as astrology. Finally, that knowledge became organized or classified, and the science of astronomy was thus born. There was a time when there was no science of agriculture—indeed, it was not so very long ago when farmers laughed at the idea of the scientific agricultural student. They no longer laugh. The science of agriculture in the form of organized and accurate knowledge is recognized to-day throughout the world, and it is making two ears of corn grow where one grew before.

We are living in an age of science. That there is much knowledge in the world pertaining to the how of building any business to greater and more profitable proportions, goes without saying. If Herbert Spencer's definition is correct—namely, that it is organized knowledge—and if we can organize that knowledge, then we will have a science. We will have organized knowledge pertaining to the how of building any business, a science which we may name "The Science of Business Building." Let us next define the term "Business Building." Business building is the art of procuring permanent and profitable patronage. To do this involves the necessity of the possession of the power to make permanent and profitable patrons, *plus* its application. I would challenge your attention to the fact that success in life commercially hinges right there. It hinges upon the application of the power to make permanent and profitable patrons. This is true no matter what line of business or busy-ness one is engaged in. Let us now briefly consider each of the concepts thus mentioned—viz., power, make, permanent, profitable, and patrons.

Patrons.

Everyone engaged in useful effort has a patron or patrons. In other words, everyone has something to dispose of, something to sell. The employee is selling his services; the employer is his patron; the barrister is selling his services to his client; the physician is selling his services to his patient; the people who patronize the retail shop are the patrons of the merchant; the merchants who run the shops are the patrons of the jobbers, manufacturers, and wholesalers; the consumers of gas are the patrons of gas undertakings, whether municipally or privately owned; the manufacturers are the patrons of those who sell the raw material; and so it goes all along the line of life. The average book-keeper at first thought would say that he has nothing to sell, that he has no patron; but he is selling his services to his employer.

It is a law of economics that the price obtained for goods is materially affected ultimately by the quantity and the quality of the goods delivered. It will be a blessed day in the business world when employees come to realize that this law relates to the sale of services just as thoroughly as it does to the sale of groceries or clothing, or iron or furniture, or anything else. And so, then, everybody has a patron or patrons; and no commercial house questions the basic truth that its power commercially depends upon the number of its permanent and profitable patrons. Let us now pass to a brief consideration of the concept "Profitable;" for business building is the power to make permanent and profitable patrons.

Profitable.

There are two classes of proprietors in charge of commercial houses. One may be termed merchants and the others just shopkeepers. There are two classes of employees behind the counter and on the road—one class may truly be called salesmen, the other consists of order takers. There is a big difference between the merchant and the shopkeeper, and there is a big difference between the salesman and the order taker. I know a great many men in various lines of commercial endeavour to whose business there is no more system than there is to a dog fight. They never know exactly where they stand as to profits, because they never know exactly what it has cost them to do their business.

A retail furniture dealer once complained to me that he was working very hard year after year, paying strict attention to business and all that, but did not seem to be able to take any money out of the business—in other words, he could not realize any cash profit. I asked him several questions, and among the rest I asked him what rent he paid. He replied that he did not pay any rent—that he owned the building. This gave me a key to the situation; and I saw that he was not accurately figuring his cost of doing business. I then asked him to name some article of merchandise which he was selling extensively. He mentioned a certain dresser. I asked him how much it cost him wholesale, and he replied $10.50 (a little over £2). I asked him what he sold it for, and he replied $15.00 (about £3). I then asked him how much profit he made, and he said $4.50 (nearly £1). After considerable figuring, having ascertained the total amount of his sales, and the total amount of his expenses, I was able to show him that, instead of making $4.50 on that dresser, he was making 30c. (a little over 1s.). He was actually losing money on the sale of many articles upon which he had been deceiving himself into the belief that he was making a profit.

Many a salesman on the road seems to think that, by reason of the fact that he is disposing of goodly quantities of goods, that he is, therefore, a great salesman. If in the grocery line, for instance, he may be taking large orders for sugar and other staples upon which the margin of profit is very small, neglecting to push specialities upon which his house makes a good profit, in addition to supplying the natural demand for the staples. Or, again, he may have a tendency to cut and slash prices so as to meet competition, forgetting the fact that the man who cuts the throat of the transaction and spills the life blood of profit is not a salesman, but an order taker. The same is true of the man who pushes the staples where margins are necessarily small and forgets the specialities.

From these little hints as to the how's of making profitable patrons, I would not have you think that I believe for a moment that money or profit making is the whole thing. The prime object of human existence is the attainment of happiness; and all the money in the world will not buy happiness. Success is the attainment and preservation of a practicable and legitimate ideal. This involves four elements: First, continuous health through which one attains a ripe old age; secondly, sufficient money; thirdly, honour—the money must be honourably obtained; and fourthly, the capacity for content in a given environment. Given these four elements and the bye-product of happiness is a natural consequence. Money, therefore, is but one of four elements necessary for complete success. But sufficient money as society is organized to-day is a necessary element. Please mark the emphasis upon the word sufficient. But sufficient for what!

Three things are necessary for existence. The three primary necessities are food, raiment, and shelter. As a means of really living rather than existence, man needs a fourth, which may be termed "accoutrements of culture," such as books, music, travel, &c. These vary according to the natural inclinations of the individual.

As society is organized to-day, and will be for a long time to come, each of these four classes of things costs money; and there are only four ways of getting money. First, the predatory method, the method of the thief and robber—namely, to take it. Second, the mendicant method, the method of the beggar—to beg it without giving value received. Third, the remittance man's method, to get it from "dad." Fourth, the earner's method—the method of earning it through the rendering of service in the way of merchandise, work, and so forth, through giving value received. This is the service method; and this fourth is the only certain and safe way of getting money. And this, the fourth way, is the way to make legitimate profit. The profit one makes is but the pay he gets for the service he renders. Profit, then, is a necessary element in a successful commercial existence. In the absence of profit, the individual or the institution cannot continue to exist commercially.

With this brief consideration of this most important item, we must now pass to a consideration of the next concept, "permanent;" for business building is the application of the power to make permanent and profitable patrons.

Permanent.

This is a concept which many who are engaged in trade seem to overlook. An important phase of building a business on permanent lines is the art of making each customer a repeater, and not only that, but making him the first link in an endless chain to bring more patrons. This is just as true of things in the nature of public service—such as the gas business—as of anything else. It is the repeaters that count. The profits on the first transaction with any given customer are often entirely absorbed through the advertising—which found and made the customer—leading him to the original purchase or in the expenses of the salesman who was sent to interview the patron. The profits on that patron, if any are to be made, must be made in future transactions. In this connection, I wish to say that I believe in advertising as a dynamic force in the building of a business. It is the fire under the boilers of business. The man who advertises just a little, and then says that advertising does not pay, reminds me of the man who burned one match under a ten gallon kettle of water and then said that fire would not heat water.

A little fire will not heat much water, and a little advertising will not build much business. But much fire will heat much water, and much advertising of the right kind in the right mediums is, indeed, a potent factor in the building of much business. Advertising takes many forms; and one of the greatest advertisements in all the world is the wagging tongue of the satisfied patron. You cannot make the tongue of the patron wag in the absence of giving him satisfaction, and you cannot give satisfaction in the absence of service, in the way of honest goods at honest prices, accompanied by the little niceties of trade which so many overlook.

It has been well said that there are four grades of people from the viewpoint of mental vision. The man who looks no farther ahead than the present, is mentally blind; the one who plans for a year, is a general; the one who plans for a lifetime, is a genius; and the one who plans for generations yet to be, is a seer, a prophet. In all I meet many business men who are mentally blind—they literally look no farther ahead than the present—the one immediate transaction now in hand. They are business getters, not business builders. They are disciples of the *caveat emptor* idea, which means, let the buyer beware. They think that trade is a question of barter. They think that success commercially depends on being sharp and shrewd and tricky—that it consists of getting the best of the other fellow. They are typified by that old story of the horse trader. A certain man bought a certain horse of a certain horse dealer. The next day he brought the horse back and said: "Why, Bill, that horse is blind." Whereupon the horse dealer answered and said: "I know it." Then the purchaser said: "Well, why didn't you tell me?" The answer of the horse dealer was this: "The fellow I got the horse of didn't say anything about it, and I thought that perhaps he didn't want it mentioned."

The horse dealers have no corner on this kind of philosophy. The practice of barter, the doctrine of *caveat emptor*, the doctrine of dog eat dog and let the devil take the hindmost, is still prevalent in many lines of trade. But let us thank God that it is rapidly passing away. From a purely business standpoint, regardless of the question of right and wrong, regardless of the question of where we are going to when we die, the square deal, born of such qualities as justice, honesty, and truth, pays big dividends. The square deal pays; and one great reason why it pays is because it tends to make patrons who are permanent. The horse buyer in question is not at all likely to patronize that particular horse dealer again, personally; and not only that, but the things which he is probably saying concerning that particular horse dealer are not conducive to boom that horse dealer's horse business.

I meet a great many men in all who are planning their business for a year, some who are planning their business for a lifetime, and a few who are planning for the trade for the houses which they are building so far ahead that they may literally be called seers and prophets in the business world—planning to have and to hold the trade of generations yet to be. I met such a merchant recently. He is at the head of an old house, one which has been established for many years. He told me that numbers of their most profitable patrons were children of former patrons. I asked him how he built his business that way, and he replied: "Through the law of service. We try to treat everybody so nicely that the parents love to bring their children with them to the shop; and we treat the children so nicely that they get the habit of coming here. When they grow to be men and women, they naturally like to trade here. When they have children, they bring their children with them." Thus is this seer and prophet in the business world planning now for the trade of generations yet to be.

Relative to this concept of permanency in trade, I would call your attention to the fact that there are four grades of people from the viewpoint of intelligence. We might say there are four grades of intelligence: First, ignorance; second, knowledge; third, learning (which is knowledge *plus*); fourth, wisdom. The ignorant man thinks that the province of trade is to *do* others good. The wise man knows that the province of business is to do others *good*. A little knowledge is a dangerous thing. Men of a considerable degree of knowledge concerning some particular business, but who are unacquainted with broad, general laws of success, often believe in barter and sharp practice as the road to commercial success.

Ethics is the science of right conduct. Business ethics is the science of right conduct in business. We have long heard of ethics in the learned professions. We have not, for so very long a time, heard very much about ethics in trade. But as man comes to the plane of wisdom—that degree of intelligence which Solomon told us was the principal thing, and it is—he comes to see that ethics pays in trade. He comes to see that it is the only road to the making of permanent patrons. He comes to see that the master business man in any line of trade is the master servant of the public. He comes to see that the science of any business is the science of service. He comes to see that he profits most who serves the best. He comes to see, among other things, that confidence is the very basis of trade; and not only the basis, but confidence *plus* satisfaction constitute the very atmosphere in which permanent and profitable patronage thrive and grow.

With these thoughts concerning the concept permanent, we pass to what must necessarily be a brief consideration of the concept "Make," for business building is the application of power to make permanent and profitable patrons.

Make.

This naturally brings us to a consideration of salesmanship, because salesmanship is persuasion; and salesmanship, as you know, is the power to persuade people to purchase product at a profit. Of persuasion there are two kinds: First, the direct; second, the indirect. Under the heading of direct salesmanship comes advertising—salesmanship by the written method; also the direct spoken word of the personal salesman. Under the second, or indirect persuasion, comes the wagging tongue of the satisfied patron. Another example of indirect salesmanship are the deeds of men in the line of public service—the work which men of altruistic spirit do for the good of the community without either direct thought or effort toward the securing of patronage for their own business.

The more I study this great problem of trade, the more clearly do I see that the indirect is sometimes even more potent than the direct.

If you speak to a second person concerning the goods of merchant Brown, then that second person has great confidence in the goods of merchant Brown, for the reason that

you cannot be charged with either prejudiced judgment or selfishness. There is nothing in it for you. Mrs. Jones tells Mrs. Smith that she should by all means go down to Mr. Brown's store to buy her goods, or to the local gas company for light. She heeds that advertisement more readily, as a rule, than does she heed the direct advice of merchant Brown, or the local gas company, or one of their representatives. This third party salesmanship very largely eliminates the possibility of any selfishness or prejudiced judgment. No matter how much you respect the salesman or the house, you cannot help but feel that a certain amount of selfishness and prejudice enters into the direct efforts of interested people to sell their goods. Thus do we see the importance of indirect salesmanship.

I have spoken of the deeds of men in behalf of the good of the community as a form of indirect salesmanship. Let me give you an example of it. At a banquet in Chicago, I once had the privilege of sitting by the side of Mr. Harry Wheeler, the Vice-President of one of the Chicago banks —a man active in the Association of Commerce work and various other organizations which are for the good of the whole community. I could see that Mr. Wheeler was taking a great interest in the Associated Charities of Chicago. He was then enlisting the services of able business men to take up a campaign in behalf of the Associated Charities. Mr. Wheeler is not the kind of a man to sit back and tell the boys to go on. He says "Come on boys;" and he goes down the line of business houses soliciting their active co-operation. He is not doing it for the sake of making money. He has no thought of that. But, do you know, when Mr. Wheeler is doing that kind of work he is a splendid advertisement for the bank of which he is Vice-President. The why of this is plain when one comes to realize that confidence is the basis of trade; and one intuitively comes to have more confidence in a man who takes part in this kind of work than he does in one who is looking after his own self-interests all the time, with no thought of others.

The facts are that there are four grades of life—four planes of consciousness. Down at the bottom is the non-conscious, the no knowing. There is life in the plant and even in the mineral; but they do not know anything in the sense that we understand the term. And next comes the plane of life known as simple consciousness, where the brute creation dwells. That dog of yours knows much; but he does not know that he knows. If he is taught any new tricks, man, who is on the next highest plane of consciousness, must teach them to him. Next in the scale of life comes the plane of self-consciousness; and there we find man. Man is a knowing and a feeling and a willing being. Not only that, but he is conscious of the fact that he knows and feels and wills; not only that, but he can even learn how to increase his powers of knowing and feeling and willing. He is not bound by the chains of simple consciousness; he has the capacity to reason, and he possesses the power of self-analysis. In view of this fact, when men tell me that you cannot teach an old dog new tricks, I generally answer: "Then don't be a dog."

A great many human beings are on the plane of self-consciousness, and insist upon remaining there; but man has the possibility of evolving himself to the next higher plane of life or consciousness—namely, the universal plane. Mr. Wheeler, whom I mentioned, is an example. He is thinking of others as well as of himself; he is doing something for the good of the community in which he lives. Such men have come into a realization of the reality of the brotherhood of man. They have perceived the fact that man, the individual, is neither independent nor dependent, but that we are all interdependent. He sees that all are parts of one stupendous whole. He comes to see that he cannot injure others without injuring himself, and that he cannot injure self without injuring others. He also comes to see that he cannot help others without helping himself, and that he cannot truly help himself without helping others. All altruistic efforts help the author of those efforts, and indirectly become potent forces in the building of his business—in the making of new patrons of the permanent and profitable kind.

However, in this question of salesmanship, the making of patrons, we cannot get away from the personal equation. We cannot get away from the potency, the power of direct salesmanship. One individual possesses the capacity of making many new patrons. Another seems almost wholly lacking in the capacity of direct persuasion. Relative to this question of the development of the power of individual persuasion, I find that a great many have the wrong idea. Some seem to be seeking to develop what might be termed an overpowering personality—a personality which will enable them to persuade the patron to buy that which he ought not to have. This is all wrong. Keep your face to the light. Forget your little self. The man who walks with his face to the light casts his shadow behind him; while the man who walks with his back to the light casts his shadow before him, and is forced to walk, to a degree, in darkness. He is walking in his own shadow; and the shadow of self-interest gets dark and deep, and his mental atmosphere becomes dreary.

Keep your face to the light of the sun of service, and go forth to fight the battle of commerce with the idea that you are going forth to serve the public; that you are going for the purpose of doing other people *good*, instead of *doing* them good. It makes a real big difference where you put the emphasis. Be diligent in the cultivation of those inherent qualities, such as judgment, memory, desire to serve, honesty, truth, faith, enthusiasm, tact, decision, and action, and your personality will take care of itself. You will develop the personality which will command confidence; and confidence is the basis of trade. You will develop the personality which will enable you to get favourable attention; and this is the first step towards the sale. Be continuously developing the positive or success qualities—those qualities which developed will give you a greater service-rendering power. Then forget self, and go forth in the true spirit of service, and your power to persuade will take care of itself.

I meet a great many salesmen who are labouring under the mistake that, in order to sell their goods, they must be very "smooth." The man who is too smooth becomes slippery. The thing to do is to, first, be a real man, and then be natural. The real man, the man that God intended, is persuasive. He carries conviction. Others come to think as he thinks, believe as he believes, feel as he feels, and do as he would have them do. They do things naturally, and because it is to their best interests to do them.

Just a few words concerning the natural born salesman, the natural born business man in general. It may surprise some of you to know that I believe in the natural born salesman. I meet a great many of them, and I love them. They are those genial, lovable, whole-souled fellows, whom Nature has bountifully endowed with certain qualities, such as kindness, optimism, energy, tact, perseverance. They throw the force of such qualities into their work; and they succeed. They work unconsciously in obedience to the natural laws of success, sometimes consciously in harmony with many of them; and, of course, they succeed. The great difficulty with many of them is that they lean so hard on their "natural bornness" that they break it in two.

I once met a gentleman in a certain club. Upon being introduced to him, he said, during the course of our conversation, "I think salesmen are born, not made." Whereupon I at once replied: "I quite agree with you." The man seemed surprised, and said, "Is that possible?" "Yes, indeed," I answered. "The only exception I know of to that rule is the wooden Indian. He is made right out of wood; and he really sells a good many cigars by simply attracting the attention of passers by to the fact that cigars are for sale. The rest are all born, so far as I have been able to discover." "And now," I continued, "let us get right down to a serious consideration of the question, 'What is salesmanship?' What is it anyway?" And the man answered: "Why salesmanship is the art of disposing of what you have for sale." I replied that his definition would not do. I told him that one could dispose of goods by giving them away. Or, again, that he could dispose of them by cutting and slashing prices—thus sacrificing all profit. I had to tell him that salesmanship was the power to persuade people to purchase product at a profit. When I had made this plain, he said: "Certainly, I know that." When the man told me that he knew that, I told him that he reminded me of the man who said he knew the multiplication table perfectly well, but could not find words to express it.

Then I asked the gentleman this question: "What does this power of persuasion come from? What is it the result of?" He replied that it might come from one thing or it might come from another. He said: "It is mostly hard work and common sense." Whereupon I was obliged to tell him that that answer would not do at all. "I know a carpenter, for instance, who is a hard worker, and has lots

of common sense, but who, at the present writing, would undoubtedly make a failure if he tried to sell goods." I next asked if this capacity to sell goods, manifesting itself in persuasiveness, did not come from such qualities as good judgment, a capacity to remember names and faces and prices, &c., and faith, and courage, and enthusiasm, and tact, and loyalty, and energy, and being a good judge of human nature, being logical and courteous, and prompt, and other qualities of this nature. He answered: "Why, yes; certainly." Then I asked him this: "Did you ever meet anyone who had such a very poor memory that he did not have any memory, couldn't remember anything, and whose judgment was so very bad that he had no judgment whatever?" "Did you ever meet anyone who was entirely devoid of tact?" I went on and named the other qualities from which he had just admitted that the power to sell goods springs; and he freely acknowledged that every normal individual—which excludes only idiots and degenerates—possesses, in latency at least, a little of each of the success qualities.

The facts are these: That which man has can be developed, and that which can be developed can be developed to a marked degree. It is simply a problem of education. Education means development, unfoldment, eduction. The term education comes from the Latin words *e* and *duco*, meaning to lead out. The road to the education of any quality is simply through the nourishment and the use of it. Give any mental quality the right mental food (nourishment), and the right exercise (use), and that quality will develop just as certainly as the muscle in the arm will develop, if you but nourish and use it. From all of this we see that the old statement that "salesmen are born not made," is but a half truth. In many ways it is a whole lie. The truth is, "salesmen are not only born, but made." And, really, is it not true that when Nature has blessed us with great natural gifts, this fact carries with it a responsibility for the care, cultivation, further eduction, or development of them?

In connection with this thought of natural bornness in the business world, I would like to make myself entirely plain on another phase of this subject. I would not be understood to advocate that everyone can or should become a salesman in the ordinary acceptation of the term. We would really be in quite a predicament if everybody should turn salesman and want to really sell goods, in the technical sense of the term. There would be no one to manufacture the goods, or do the office work; no one to practise medicine, or practise law, or run flying machines; and so on through the various vocations. It is a question of every man for his work; and the world will always need "hewers of wood and drawers of water." I believe, however, that all will agree with me in this—that it should be the ambition of the one who "hews wood" to hew it better than anyone ever hewed it before; and that the "drawers of water," and the men who practise medicine, and the men who run flying machines, and the man or woman who fills any niche in the world's work, needs the development of his or her inherent qualities—the qualities which make real men and real women, the qualities which make true manhood and true womanhood. Each should then apply those qualities to the work which it is for him or for her to do. Personally, I believe that I would be very foolish to attempt to apply myself to the work of either practising medicine or running a flying machine. I believe that it would be dangerous to either the patients or the passengers. That is not in the line of my natural bent. This fact, however, does not lessen the truths that either the physician or the aviator needs to develop his judgment, his memory, his tact, his honesty, and all the other qualities which are but channels for the expression of natural law in the business world, the world of *busyness*, no matter what one is doing, so long as it is useful effort.

I know, too, that there are thousands of people who are square pegs in round holes and round pegs in square holes. They do not fit their work, and their work does not fit them. In the words of Emerson, "They have not found their work." I know there is many a human rose that is born to blush unseen, and waste its sweetness on the desert air of that which is to them uncongenial employment, such as office work or factory work, who could just as well develop their talents and apply them to the direct work of selling goods behind the counter, or out on the road, in the fields of either wholesale selling, specialty selling, or even in the work of promotion, eventually—thus creating new enterprises. I know that this could often be done with infinitely greater profit to those thus applying themselves, if they but had the courage to undertake it, and that faith in self, the lack of which is holding thousands back in the march of progress. I know, too, that there are thousands of professional men who are not making a success of their profession simply because they fail to recognize its commercial side. There is a great difference between making a professional success of one's business and a business success of one's profession.

I once knew a lawyer or barrister who knew Blackstone's "Analysis of Common Law" by heart. He knew law, and knew it thoroughly; but he failed utterly as a practitioner because he was a failure at selling his goods, his services, to the public. The good lawyer, while he neither advertises nor directly solicits business, must indirectly persuade people to become his patrons. The man to whom I refer was a recluse. He never "mixed." People did not know him. He waited and waited for clients to come; he waited in vain, and nearly starved to death, even though he had good goods to offer. Many a painter of pictures has failed to make the profession of the artist a success, simply because he lacked the commercial sense and could not successfully market his product. We find this is true all along the line of life, and that success in life commercially is potently influenced by salesmanship—the power to persuade people to purchase product, services or otherwise, and at a profit.

We now come to a discussion of the concept "Power;" for business building is the application of the power to make permanent and profitable patrons.

Power.

Everyone has some degree of that power, otherwise he could not exist commercially. The question for us to consider is this: "Is the power susceptible of development?" In approaching a discussion of this particular concept in our definition, I would first call your attention to the fact that success in life is governed by eternal law, not luck. Those who succeed, work either consciously or unconsciously in harmony with natural law; those who fail, violate so many of the natural laws of success that they pay the penalty in failure. Occasionally someone challenges this statement. A good man recently challenged me when I made it; and I asked him to give an example of hard luck. He replied: "I know a certain poor widow who has all kinds of hard luck." I asked him to give me an example of her hard luck. As such an example, he related the fact that her neighbours had recently purchased a cow for her, and that the cow was killed in less than a week. I asked him where she kept the cow; and he replied: "In a little pasture." I asked him where the pasture was located; and he told me it was near the railroad track. I then inquired as to the condition of the fence; and after thinking for a moment, he said the fence was in pretty bad shape, whereupon I replied as follows: "That was not hard luck. A law of Nature has been in force through all the ages since man arrived, which, if put in writing, would read: 'If you would be successful, you must be careful.' The widow violated the law of carefulness, and paid the penalty in the loss of her cow."

The employee is late in the morning. Late again, late again—fired. Hard luck! Oh, no! it was not. Successful men and successful institutions reflect Nature's laws; and Nature is always on time. The astronomer knows that so well that he can focus his instrument on a given point in the heavens and rest with faith, knowing that the heavenly body which he is expecting will be there at the time expected. He knows this by reason of the fact that he knows that Nature is always on time. I have known salesmen, or, rather, order-takers, to be late to important appointments, and then curse their hard luck because they failed to see the man with whom they had the appointment. They were simply obliged to pay the penalty of the violation of natural law in the business world.

Can we organize the natural laws of success in the business world? We cannot have science in the absence of organization. Science, as we have already seen, requires two things: First, tested truth; second, organization of that truth. Science is not theory, or theoretical. Science deals with tested truth. When a theory has been tested and found to be true, it is no longer theory—it is fact. Sufficiently organize tested truths, and the result is science, which, as already stated, is nothing under the sun but organized knowledge or classified common sense. When Blackstone organized the common laws of England, he did not make any new laws—he simply organized those which were already in existence. He perceived the fact that they

would quite naturally group themselves under four general headings. First, the rights of persons; second, the rights of things; third, public wrongs; fourth, private wrongs. With this basic classification, he bracketed and rebracketed and bracketed again and again and kept on bracketing—thus dividing and subdividing until order came out of chaos. Disorganization gave way to organization, classification, and the science of the common law was born. In giving the science of common law to the world, Blackstone rendered a great service to the legal profession, and, indirectly, to their clients in all vocations.

Careful thought reveals the fact that in any transaction, business, or professional—in fact, in all human relationships where mind meets mind, there are but four factors present: First, the party of the first part; second, the party of the second part; third, the thing concerning which the party of the first part and the party of the second part are negotiating; fourth, the meeting of the minds of the party of the first part and the party of the second part in common agreement. Around these four factors, as a basis for classification, it is possible to group all the natural laws of success in the building of any business. With this basic classification in mind, it is possible to bracket and rebracket and bracket again and keep on bracketing till chaos gives way to order, and the science of building any business is born. The very best we can do in the brief space of time at our command is to touch some of the high places in a discussion of the laws of success entering into the science of building any business. We cannot begin to do the subject justice. But if you will kindly bear the classification in mind, I will do the best I can to make plain as I see them a few of the very basic or fundamental natural laws of success in the business world or the world of *busyness*, the world of work, which, mastered and applied, result in increased power, and the application of it to make permanent and profitable patrons in the gas business or any other business.

It has been well said that all of Nature's important laws could be written on the signet of a ring. It may be said with equal force that the fundamental laws of building business may be written in a very small space indeed. From one viewpoint, they resolve themselves to the matter of obedience of four injunctions, which are as follows: First, know yourself; second, know the other fellow; third, know your business; fourth, apply that knowledge to the end of focusing mental agreement. Let it be noted that the first of these laws relates directly to the first factor in our basic classification—namely, the party of the first part. The second injunction relates specifically to the second factor—the party of the second part. The third injunction relates specifically to the third factor—namely, the thing concerning which the party of the first part and the party of the second part are negotiating. While the fourth injunction relates specifically to the fourth element in any transaction—the meeting of the mind of the party of the first part and the party of the second part in common agreement.

A law is a rule of action or conduct; and reduced to the form of law, these injunctions would read as follows: First, If you would enjoy complete success in the building of your business, you must know yourself. The second injunction would read as follows: If you would enjoy complete success in the building of your business, you must know the other fellow—the party of the second part. In other words, you must know human nature; you must know how to read accurately the great book of human nature as it is written in the faces, forms, colours, actions, and manifest motives in human kind. The third injunction, reduced to law, would read: If you would enjoy complete success in the building of your business, you must know your business—you must know all about that business—you must know all the points that can truthfully be made concerning it. And the fourth injunction, reduced to law, would read: If you would enjoy complete success in the building of your business, you must apply the knowledge of yourself, the other fellow, and your business to the end of bringing about a mental agreement between the party of the second part and yourself concerning that which you are negotiating.

Each of these general laws has related to it many subsidiary laws; many laws which are related to these general laws, all subject, however, to exact classification. We must do a great many things in order to know self, know human nature, know our business, and apply that knowledge to the end of focusing mental agreement. Let us now briefly consider a few fundamental truths pertaining to each of these four basic injunctions.

Know Thyself.

Socrates gave us that injunction a long time ago. The trouble with many is that we have not minded him very well. The road to exact and minute knowledge is analysis; and if we are really to know self, we must begin by analyzing self. Analysis is the process of separation into parts. Man is both objective and subjective. He is both concrete and abstract. The objective or concrete part of man is his physical body. The subjective or abstract part of man is his mind. The body is a tangible thing; we can sensate it. By this I mean we can see it and touch it, and otherwise subject it to the physical senses. The mind is an intangible thing; but it is none the less real. If man is to know himself, and thus obey the first basic law of building his business, he must know his body, and he must know his mind. Someone may ask at this point: "Do the terms 'body' and 'mind' express all there is of man? How about the soul?"

Let me say at this juncture that, personally, I believe in the human soul and its immortality—I do not believe that this is the end of the trip. But we are talking business; and I shall only discuss the physiological man and the psychological man. Therefore, our primary analysis of man for the purposes of our discussion shall be that he equals a body *plus* a mind. If man is to really know his body and know his mind, he must analyze each; and he must come to an understanding of the laws governing the development of the latent power of the physical man and of the mental man. It is a fundamental truth that if you make the man right, his work takes care of itself; but he must be right in both body and mind. And we each have much to do, if we are but honest enough to admit it, in order to make and keep self right.

In final analysis, the science of building a business is the science of building men. The science of business building is largely the science of man building. The business of life building is the life of business building; and the life of business building is the business of life building. There is one thing more grand than making a living, and that is, making a life. If you make the life right, the making of a living, and the consequent building of a business, takes care of itself. No man can enjoy his greatest possible measure of success in the absence of a sound body—one which can endure the stress and strain of business. No one can have a sound body permanently who is continuously disobeying the law of physical well being. Yet we find thousands of business men always paying better attention to their automobiles or their bicycles than they do to their own human engine. Thousands of men are digging their graves with their teeth; thousands upon thousands are breathing backwards; thousands are disobeying these and other laws of physical well-being from the time they get up in the morning till they go to bed at night, and then complaining more or less of their hard luck manifest in ill-health. Their condition is not the result of hard luck, but purely and simply the disobedience of natural law. The man who thinks right, eats right, breathes right, and exercises right will come pretty nearly being all right physically. To do each of these things right is a natural law of success. These and many other natural laws of success should be studied by the business man, all related to the one thought of making and keeping himself right physically. But we have not time to dwell upon these natural laws of physical well-being. The very best I can hope to do is to challenge your attention to the existence of them.

Now let us for a moment briefly analyze the unseen, the invisible, the intangible part of man, but which is really the dynamics of man—the mind. When the mind leaves the body, then the physical man is no longer of any consequence. We bury it in the ground or burn it. Yet relatively few business men give any thought to the study of their own dynamics, or the how of increasing their mental forces. It is a relatively simple matter to analyze the mind, and, therefore, know it. There are really three grand divisions of the mind. First, that part of the mind with which we know; second, that part of the mind with which we experience feelings; third, that part of the mind with which we will. All the mental states which anyone ever experiences may be classified as states of knowing, states of feeling, or states of willing. These three grand divisions of the mind may, in turn, be separated into qualities. Thinking, for instance, is an intellectual or knowing quality; so is remembering, likewise imagining. These three are all intellectual or knowing attributes of the mind. On the other hand, enthu-

siasm, loyalty, earnestness, courage, faith, honesty, justice, &c., belong to the feelings. Again, the quality of decision and the quality of action belong to the will part of the mind. It will be a blessed day in the business world when all business men come to a keen realization of the fact that their success in building their business does not by any manner of means depend alone upon how much they know about their business. Nor, indeed, does it depend on their knowledge alone, no matter to what that knowledge may pertain. It depends fully as much upon their physical condition, on the feelings which they develop and exercise, and on their will, as it does upon what they know.

The other two divisions of the mind—namely, the feelings and the will—are fully as important as factors in the building of a business as is their knowing power. Success depends not upon what you know, but upon what you are; and what you are depends upon your qualities, upon your developed and exercised qualities. These qualities, as we have seen, fall under four headings—namely, physical qualities, knowing qualities, feeling qualities, and willing qualities. The normal man—and this excludes only the idiots and the degenerates—possesses some sixty success qualities, possibly more than that, but that is enough to keep most of us busy for awhile. If man is to build himself in body and in mind that he may in turn build his business, he must be active in the work of the development of these qualities; and if he is to be truly successful, he must develop them to a marked degree. The mild degree makes the ordinary man; the marked degree makes the extraordinary man.

While time forbids a lengthy discussion of the how of the development of the success qualities in men, I would call your attention to one truth which may prove helpful. I refer to the great law of doubles, which extends all through Nature. The positive of light has its corresponding negative in darkness. Heat has its cold. Fertility its sterility. This analogy applies to man as to his qualities. The opposite of health is sickness; and somewhere between sickness and perfect health, there you are. The opposite of memory is forgetfulness; and somewhere between forgetfulness and perfect memory, you are. The opposite of the feeling of faith is doubt; and somewhere between doubt and perfect faith, you are. The opposite of the feeling of courage is fear; and somewhere between the two, you are. The opposite of the will quality of action is inactivity; and somewhere between inactivity and perfect action, you are. Your power as an individual being is in due proportion to the power of your positive or success qualities. This power, in turn, is in proportion to the degree of the development of them.

Every positive has its negative; every negative has its corresponding positive; and we all have negative qualities. The positive or constructive qualities are success qualities. The negative or destructive qualities are failure qualities. Each of the positive qualities is a channel for the expression of a natural law in the business world. For instance, one of the laws of success reduced to writing would read this way: If you would enjoy your greatest possible measure of success, you must not forget. Stated positively it would read, Thou shalt remember. Yet what are you doing to develop your mental muscle of remembrance? Are you cultivating it, or are you trusting to natural growth? The same truth applies to each of the sixty or more success qualities which you possess. The laws for the building of a better memory are exact. The laws for the development of each and every one of the success qualities are exact. Man building is to-day a science.

One more fundamental truth under the general heading of the broad basic law of "Know thyself," and we will pass to a consideration of the second injunction. Someone may be mentally inquiring: "How are the positive or success qualities to be developed?" My answer is: "Through education; but through true education." And I do not use the term education in the ordinary acceptation of that term. I asked three men in a hotel recently this question: "When did you receive your education?" Each one figured out as nearly as he could the day he commenced to go to school and the day he finished school life, and then replied: "It was during those years that I received my education." The term education is quite commonly accepted as being synonymous with schooling. People are supposed to get their education when they go to school. I meet a great many who are lamenting something like this: "Father could not send me to college, therefore I have no education, therefore what is the use?" The facts are that the true meaning of education seems to have been largely lost. It is the lost word. For in its root meaning, coming as it does from the Latin words *e* and *duco*, it means, as I have before stated, to lead out, to draw out. It means to unfold, to develop; and, for the sake of emphasis, I repeat here the truths I have before sought to make plain—namely, that the road to this development, this education, the education of any of the success qualities, lies in the nourishment and the use of them. Education is a result; educating is a double process—both nourishment and use. Education is an effect; educating is a cause.

But I must hasten. I will only have time to very briefly mention the second of the four great injunctions for the building of a business—namely,

Know the Other Fellow.

We all agree in this, that, other things being equal, it is the best judge of human nature who has the best gas business, who sells the most goods, no matter what his line may be, or who is the most successful in the building of a legal practice, or a medical practice, or any other branch of professional life. We know that it is a great asset to the credit man—indeed, to anyone, no matter what niche he fills in the world's work. It is a great social as well as business asset. I recently interviewed a very successful railroad man, a division superintendent, having under his guidance the efforts of many men. He was making a marked success. Seeking for the natural laws back of his success, I asked him to what more than to any one thing he attributed his success. Without any hesitancy he replied as follows: "To my ability to put square pegs in square holes and round pegs in round holes—in other words, to my ability to read human nature." I asked how he had acquired this ability. He answered: "By the study of human nature, and," he added, "I read everything I can find on the subject—not only read it, but study it. I study railroading. But I also study human nature; for human nature, the human being, is the most important factor in railroading."

The average business man prides himself upon reading human nature intuitively, and feels that all he learns about it must be learned in the school of life—that the knowledge which he gains in this line must needs all be gained through the channels of his own personal contact with people. This is indeed an important channel for gaining such knowledge; but it is not the only one. Specialists are devoting their lives to this subject of reading human nature, and the accurate classification of individuals from the viewpoint of types and temperaments. Very much of this knowledge is classified, thoroughly accurate, and reliable. It has been well said that if a man is not up on a thing, he is generally down on it; and this saying applies with great force to the subject of reading human nature.

Condemnation is more frequently than otherwise the child of ignorance. It is a dangerous thing to-day to condemn in the absence of specific knowledge. We are living in a progressive age, in a scientific age, in an age when knowledge in every line is rapidly being reduced to a scientific basis. We are living in an age of the survival of the fittest. It means more to be fit to-day than it did ten or even five years ago. Yes, more than it did even one year ago. It will mean still more to be fit and to have the fitness to survive five years from now than it does to-day. And one important element in the fitness of man to survive in the race of business life is his capacity to accurately measure men. But the time at our command prohibits me from even attempting to teach any of the scientific principles in the reading of human nature.

Let us now come for a moment to that which must necessarily be a very brief consideration of the third basic injunction in business building—the one relating to the third factor in the deal, the injunction which reads

Know Your Business.

Again I challenge attention to the fact that the road to exact knowledge is analysis. If the gas man or anyone else is to know his business, he must analyze that business; and again I say that analysis is the process of separation into parts. From the view point of the business-building salesman—the one who is engaged in the specific work of selling goods—one of his first duties, so far as his goods are concerned, is to find out all the points which can truthfully be made concerning their merits. The road to the gaining of these points is analysis. The true salesman is a teacher. It is, or should be, his province to teach the prospective

patron concerning the merits of his goods. In the case of the gas salesman, he must, as a result of complete analysis, be able to show all the good points of gas as compared to other forms of lighting and heating.

What we want in salesmanship is men not of just words, words, words, but points, points, points; and each should be a pointed arrow that goes straight to the minds and the souls of men. The day of the human windmill, the verbal cyclone, and the living talking machine, are out of date in selling goods. A great many salesmen talk too much—they tire the customer out. They talk him into buying a thing, and then they will actually talk him out of it again. Some talk so much that they tell all the truth concerning their goods. And then some!! Marshall Field was the greatest merchant of his time in the United States; and one of his guiding stars was this truth: "The man who lies to sell goods is a fool."

A great many salesmen in retail stores do not know their goods—they know almost nothing of the history of or the how of manufacture of many things which they have for sale. The time is coming—indeed, it is rapidly approaching—when the salesman (retail, wholesale, specialty, or promoter) will be obliged to study each thing he sells and to prepare his case concerning these goods for the presentation of the merits of them to the mind of the prospective purchaser, just as earnestly as the lawyer studies each case that he may be able to intelligently present the merits of that case to the judge or to the jury. He will be expec ed to know as much about his goods as the physician knows about the medicines which he gives to his patients. Not that he will either need to or find it advisable to give each prospective patron all the points which he has in his possession concerning any given article. It would be a foolish physician who would give all the medicine in his chest, or all the different kinds of medicine, to each patient. It is a wise physician, however, who has at his command, either in his chest or in the chemist shop near by, all the different kinds of medicine which he may need.

As an illustration of the lack of knowledge on the part of retail salesmen concerning the real merits of the goods they have for sale, I would cite one or two illustrations: First, a friend of mine recently went into a retail clothing shop for the purpose of buying a suit of clothes. The salesman, or rather the order-taker, who waited upon him exhibited two suits of clothes and told his prospective patron that the price of one suit was £5 and the price of the other was £8. My friend asked the salesman the question: "What is the difference between your two suits of clothes?" The man answered: "There is £3 difference." My friend then said: "Pardon me, but I can figure that out. What I want to know is the real difference between the two suits. Why is it that one could sell for £3 more than the other?" Whereupon, the man replied: "Why one has better cloth in it than the other." My friend then asked him why it was better cloth—what made it better cloth; and the man could not give him any intelligent answer.

Second. This same friend had learned that a certain kind of bead was on the market—a very fine imitation of pearl, manufactured, I believe, from fish scales. A friend had told him that they were on sale in a certain shop. He went to the shop and was told by three different shop walkers that the shop did not have any such thing. He was persistent, however, and finally found one shop walker who directed him to the department where they could be found. He then found a saleswoman who exhibited the beads. He noticed that one particular string sold for about £2 while another sold for £3. He asked her to tell him the difference between the two; and she answered the same as the clothing salesman answered—namely, that there was a difference of about £1. My friend then said: "What I want to find out is something about the real merits of this line of goods. Why is it that your firm charge so much more for one string than for the other?" The young lady answered: "I guess it is because they need the money."

My friend left the shop without making a purchase. He went to a regular jewellers' shop and found the beads in stock; but received no more satisfaction from the salesman than he had obtained from the saleswoman previously. He was about to leave the shop without making a purchase, when the proprietor, who had overheard the conversation between my friend and his employee, stepped up to my friend and told him he believed he could give him the information he was seeking. He then gave him exactly the particulars he was seeking—in a word, he taught my friend concerning the merits of the imitation pearl beads, with the result that he purchased two strings, although he had intended buying only one.

I might add that the clothing salesman whom I mentioned had been selling clothing in retail shops for twenty years. I hope and believe that conditions are not so serious as this in the gas industry; but I have yet to find the business in any commercial line where the knowledge of those engaged in it could not be improved by an application of the principles of analysis to that business.

Apply the Knowledge.

We will now come to a brief consideration of the fourth injunction to the business builder; the one which applies to the fourth factor in the deal—namely, apply the knowledge of self, the other fellow, and your business to the end of focussing mental agreement. But our consideration of this fourth injunction must necessarily be very brief. I must content myself with the calling of your earnest attention to the fact that there are laws of mind as exact in the realm of mind as are the laws of gravitation in the realm of matter. If we are to be truly successful in the getting and keeping of more patrons, it behoves us to understand those laws; for in final analysis, all trade is a mental thing. The deal is made in the mind, it is not made in the pocket book or the cheque book. That which takes place in the pocket book or the cheque book is merely an evidence of the fact that the minds have met in common agreement.

All commerce really boils itself down to the question of the seller inducing in the mind of the buyer six mental states or conditions. The first of these is favourable attention; the second is the feeling of interest; the third is the feeling of desire; the fourth is action which in commerce is the act of buying. The following are exact laws: First, favourable attention properly sustained will change to the feeling of interest. Second, the feeling of interest properly intensified will change to the feeling of desire. Third, the feeling of desire properly intensified will change to action. Permeating these four mental states must be another mental condition—namely, the feeling of confidence. After the property has changed hands, after the deal is made, the feeling of satisfaction must take place and remain permanent in the mind of the patron. The business builder must always keep in mind the cement of satisfaction, making permanent the concrete of confidence, which is the basis of all trade, if he would build a superstructure of permanent and profitable patronage.

The success of an institution is but the sum of the successes of the individuals engaged in its service. If everybody from porter up to president is making good in a big way the making good of the composite salesman, the institution itself will take care of itself; and the success, the making good power of the institution, commercially, is in due proportion to its power to induce in the mind of the buying public the six mental conditions which I have enumerated—namely, favourable attention, interest, desire, action, confidence, and satisfaction. This power is, in turn, intensified, developed, made to increase in proportion as each individual engaged in the service of any given institution comes into an understanding: First, of self, and the laws entering into the knowing of himself, to the end of building himself through the growth of the positive constructive or success qualities; secondly, as he comes into an understanding of the how of reading human nature; thirdly, as he comes into an understanding of the how of knowing his business; and fourthly, as he applies that knowledge.

But please mark the emphasis on the word apply. Knowledge alone is but static power—it is but stored power, it only becomes dynamic when it is applied. The test of men is in what they do, not in what they know. The efficient man does things; and there are four grades of efficiency. Down at the bottom of the ladder of efficiency come the indifferent class; and you find them in every calling, the gas business included. In the great indifferent class you will find the inefficient, the I-don't-care fellows, the fellows who are just in it for the ride. They are generally ruining their eyesight looking for more pay, forgetting that if they would only look for the opportunity to do more work—to render a greater service—the more pay would take care of itself. They are usually wishing for success; but they generally take it all out in wishing. They have a wishbone where the backbone ought to be. They live down in the I-can't colony, and have a perpetual membership in the what's-the-use brigade.

Just above this class stands the student class—those

whose minds have awakened and who are looking out broadly upon things. Consciously or unconsciously, clearly or dimly, intellectually or intuitively, they have perceived the fact that life is governed by natural laws, not luck; and they are earnestly seeking for an understanding of these laws. To this end they are students of men and of institutions, and of journals and of books, of environment, and of things. Just above the student class stands that smaller class—the adepts, the artists, those who are truly adepts (artistic) in the doing of their work, whether that work is the hewing of wood and the drawing of water or the administration of the affairs of State. The adept, the artist, is a doer of deeds—he does things; he applies his knowledge; he applies it artistically to the doing of things, or rather to the doing of things artistically. The student may stop with the knowing; the artist never stops short of the doing. But the artist has, consciously or unconsciously, entered the temple of high art through the door of knowledge more or less organized. Science is the open door leading into the temple of high art.

Finally, at the top stands that small class—in numbers the smallest class of all from the viewpoint of efficiency—the masters. With the master, the doing of it right, right now, has become automatic. It is a habit. He initiates, he creates, he leads where artists and students follow with the indifferent class lingering in the rear; and the reason there is so much room at the top is because there are so few masters. No master ever became a master until he was first an adept, no adept ever became an adept until he was first a student, and no student ever became a student until he roused himself from the sleep of indifference, climbed out of the bed of I-don't-careitiveness, cancelled his membership in the what's-the-use brigade, and moved out of the I-can't colony.

Conclusion.

In conclusion, I would call your attention to the seed from which the man tree, grown to mastership, springs. It is the seed of "desire to be of service to the world." The function of trade is not that of barter. The first, the prime function of every legitimate business, is that of service. Our master merchants are the master servants of their patrons; our master physicians are the master servants of their patients; our master lawyers are the master servants of their clients. Truly, the greatest among ye shall be your servant. Verily the greatest gas company of any given territory shall be the one which is the greatest servant of the gas-buying public.

John Wanamaker, who is possibly the greatest local merchant of his times in the United States to-day, once said to me: "If I can render a greater service to the people than any other merchant, then the people will make a beaten path to my door." The profit you make is simply the pay that you get for the service which you render. Serve each of many people, getting from each a little pay—in other words, legitimate profit—and the total profits will mount very high.

The greater the service, the greater the profit; and this is legitimate. The servant is worthy of his hire. If you serve well, you are entitled to profit much; if you do not serve well, you are not entitled to much profit; if you do not serve at all, you are not entitled to any profit. Let me hold my hand at arm's length, and I can see it real well. Bring it very close to my eyes—right up against my eyes—and I can't see it at all. Not only that, it shuts out the view of the world. The moral is, you can get so close to a thing that you can't see it; and millions of business men, employers and employees alike, get so close to the almighty dollar in their chase for it that they not only can't get it, but it comes to shut out the view of the world. Let these same men, with a broader mental vision, turn attention to the how of rendering greater service to their patrons, and the getting of the dollar will take care of itself.

If you want heat, you do not go out searching for neat, you build a fire, you light the gas; then the heat comes as a natural consequence. If you want the heat of money, the enjoyable warmth of profit, you must first build the fire of service, and then the warmth of profits comes as a natural consequence. Service is cause. Profit is effect. He who would truly succeed must obey the laws of cause and effect in the business world.

As a final summary, I would leave three circles on your screen of consciousness. It is my earnest hope that you will help me write them there in a way that they will never be effaced. The first circle, the large one, the outer circle, let us label Business Building—the power to make permanent and profitable patrons. With this circle on the screen of consciousness, draw another circle, a little smaller, just inside the large one, and label this second circle "Salesmanship." We will define this as the power to persuade patrons, directly and indirectly, through words and deeds, to purchase your product at a profit. Inside this second circle draw a central circle, and label it "Service." Define this as the power to serve to the end of satisfaction and profit of both the buyer and the seller. Thus do we see that while the body of business is business building, the life blood of it is salesmanship; but the heart that pumps that life blood is service—the power to serve to the end of satisfaction and profit of both the buyer and the seller. When the last count is in, we shall find that the science of building the gas industry, or any other business, is the science of serving the world, in the functions of that particular business; and we will find that he profits most who serves best.

GAS EXHIBITION, 1913.

A Conference on the Subject at Manchester.

Taking advantage last week of the attendance of the members of the Commercial Gas Association at the Manchester Conference, the Provisional Committee appointed in connection with the proposed Gas Exhibition next year convened a meeting on the Monday afternoon, at the Midland Hotel, for the purpose of making further arrangements in connection with the project. The meeting was well attended by representatives of gas undertakings from all parts of the United Kingdom, and also by members of the Society of British Gas Industries.

Mr. Corbet Woodall, who presided, mentioned that the Provisional Committee, having gone thoroughly into the matter, decided, in view of the support accorded to the project by gas undertakings throughout the United Kingdom, to proceed with the exhibition; and the object of this meeting was to place before those present a few details regarding the scheme, with the view to securing the hearty support and co-operation of the entire gas industry. An interval of something like nine years had elapsed since the last International Exhibition was held at Earl's Court; and during this interval vast strides had been made in all departments of the gas industry. The Council of the Institution of Gas Engineers were assured by the Council of the Society of British Gas Industries that the project would have the hearty support of their members; and it was anticipated that the combined efforts of the gas undertakings and the manufacturers throughout the United Kingdom would result in an exhibition worthy of the great industry, and also of the important occasion it was intended to commemorate—viz., the Jubilee of the Institution and the Centenary of Gas.

Mr. Edward Allen (Chairman of the Provisional Committee), on being asked by the Chairman to give an outline of the movement, briefly referred to the steps which had been taken by the Committee in order to bring matters to the present position, and said he had been asked to enthuse the members of the Society of British Gas Industries as a whole. But he felt his was an easy task, because the representatives of the Society who had been acting on the Provisional Committee had already given most unmistakable evidence that the Society needed no enthusing; and it was only necessary for the scheme to be brought before the whole of the members in a definite shape to ensure their whole-hearted support. He felt sure that the suggested scheme would be enthusiastically endorsed by the manufacturers.

Mr. F. W. Goodenough (the Deputy-Chairman of the General Committee of the British Commercial Gas Association), as Chairman of the Sub-Committee, was then invited by the Chairman to give some particulars regarding the lines upon which it was proposed that the exhibition should be organized. He stated that the gas undertakings and manufacturers had agreed upon a distinct departure from the usual plan of trade exhibitions; a co-ordinated scheme having been arranged whereby the advantage and uses of gas would be presented to the public on altogether novel lines, which would appeal to them in an attractive and forcible manner, and on a scale never yet attempted. Instead of the usual series of stalls, where manufacturers were vying with one another as to who could make the largest display of lighting and heating, irrespective of the general effect of the exhibition, the display would be of a uniform character—everything being presented in a manner at once pleasing and effective, and designed to show gas in the most practical and most advantageous manner possible. The Committee had, after very careful consideration, secured a series of halls in connection with the White City at Shepherd's Bush, which were admirably adapted for the purposes they had in view. By the adoption of the co-ordinated scheme to which reference had been made, it would be possible to give exhibits of various dwellings for the working classes, for the middle and the upper middle

classes, and superior houses and flats, all of which would attract the public. It was also proposed to demonstrate the advantage of gas for manufacturing purposes by fitting up a series of model shops, where jewellers, book-binders, painters and artists, printers, &c., would be actually carrying on their occupations. The medical profession would be appealed to by means of model hospital wards, with professional nurses in attendance; and the scholastic profession would be specially interested in a model school-room. For the benefit of ladies, there would be provided a model laundry, model nursery, and other exhibits of a similar character. The business man would be shown ideal offices, libraries, &c. Cinematograph views would be shown, with illustrations from the colliery to the finished article. In the machinery hall would be displayed the most up-to-date apparatus associated with the production of gas; while by means of charts, and working in co-operation with the Coal Smoke Abatement Society, the public would be educated as to the value of gas from a sanitary aspect. With the view to showing model lavatories, special attention would be paid to the lavatory accommodation—a point too often neglected in exhibitions. Cloak-room accommodation would also be provided. For the convenience of visitors generally, it was proposed to provide rest-rooms, reading and writing rooms for both ladies and gentlemen, with an ample supply of stationery, a ladies' boudoir, a smoking lounge, dressing-rooms, postal, telegraph, and telephone facilities, a restaurant, &c. There would also be a magnificent reception room and a banqueting hall, where it was hoped that many important functions would take place during the month the exhibition would be open. This brief outline of the suggested arrangements would be sufficient to indicate that the exhibition would be run on such lines as would be certain to lead to a successful issue; and all that was required was the hearty co-operation of the industry as a whole to provide the requisite funds for the purpose.

Mr. WOODALL remarked that, while it was possible the Executive Committee, when appointed, might wish to make some alterations in matters of detail, the principle of the scheme which had been submitted would doubtless commend itself favourably to all present; and he felt sure its adoption would largely benefit the gas undertakings of the United Kingdom.

Alderman F. S. PHILLIPS then moved the following resolution—

> That, having received the report of the Provisional Committee announcing their decision to proceed with arrangements for holding a Gas Exhibition in October, 1913, it is resolved that those attending the present meeting pledge themselves to do all in their power to bring the exhibition to a successful issue.

He said he felt assured that the time had arrived for holding a large exhibition in London, and the scheme would have the hearty support of gas undertakings everywhere.

Councillor KAY seconded the resolution, which was supported by Mr. FRED. J. WEST and Mr. W. D. HELPS (as representing the Society of British Gas Industries), and carried unanimously.

Mr. R. G. SHADBOLT then moved—

> That an Exhibition Committee be formed, consisting of a representative of each undertaking and firm subscribing to the exhibition, *plus* the Council of the Institution of Gas Engineers, the Council of the Society of British Gas Industries, and the Executive Committee of the British Commercial Gas Association.

Mr. CYRIL G. DAVIS (Hon. Secretary of the Society of British Gas Industries) seconded the resolution; and it was carried unanimously.

Mr. B. R. GREEN next proposed—

> That the Provisional Committee, as follows, together with a representative of each undertaking subscribing not less than £200 to the guarantee fund, be elected as the Executive Committee of the Exhibition—namely,

Mr. Corbet Woodall, London.	Mr. W. D. Helps, Leeds.
Mr. Edward Allen, Liverpool.	Mr. A. A. Johnston, Brentford.
Mr. J. Ferguson Bell, Derby.	Mr. R. G. Shadbolt, Grantham.
Mr. John Bond, Southport.	Mr. S. Y. Shoubridge, Sydenham.
Mr. T. S. Clapham, Keighley.	Mr. H. M. Thornton, London.
Mr. Cyril G. Davis, London.	Mr. Fred. J. West, Manchester.
Mr. F. W. Goodenough, London.	Mr. H. J. Yates, Birmingham.
Mr. E. H. Hudson, Normanton.	

The resolution was seconded by Mr. PERCY F. HOLMES, and agreed to unanimously.

A vote of thanks to the Chairman, to which Mr. WOODALL suitably responded, brought the meeting to a close.

Addenda to Reeson's "Gas and Water Acts."

Many of our readers are doubtless acquainted with the exceedingly useful volume published by Mr. Joseph Reeson, containing a collection of the Acts relating to gas and water supply passed between 1817 and 1902. After the first appearance of the book, Mr. Reeson, it may be remembered, enhanced its utility by issuing separate leaves, for insertion, containing notes as to subsequent additions, repeals, and amendments. He has now sent us the latest of these supplements, showing the changes appearing in the Acts of the Gaslight and Coke Company of 1909 and 1911, arranged in the order of the provisions in the text to which they relate. These are followed by summaries of certain sections referred to in the tabulation. The leaflet may be purchased separately, at the price of 6d.

GAS ACTS FOR 1912.

[THIRD ARTICLE.]

IN surveying the new Gas Acts for the purpose of ascertaining the changes made since the Bills were introduced (see Jan. 23 last, p. 209), we come now on to a solid block of statutory gas company measures, some of which are of very considerable importance—including, as they do, two important amalgamation schemes, and the transfer of the standard quality of gas in both concerns from illuminating power to calorific value.

The South Suburban Gas Act provides for the amalgamation of the Bromley and Crays and the West Kent undertakings by agreement on terms which have been published in our columns, and referred to from time to time. There is no necessity to again traverse the ground. In connection with this amalgamation, a clause has been inserted providing that so much of the parish of Mottingham as was immediately before the date of transfer being supplied with gas by the South Metropolitan Gas Company shall not be included in the limits of supply of the Company. As to the price of gas in the Bromley and Crays district, it is to be, until June 30, 1919, 7d. higher in the old Bromley area than is charged in the South Suburban area, and in the old Crays district higher by 10d. until June 30, 1918, and then until June 30, 1919, 7d. Thereafter, the price is to be annually reduced by 1d. until the difference in charge between the Bromley and Crays and the South Suburban areas is extinguished. The price in the West Kent area is to exceed the price in the South Suburban area by 1s. 9d. until June 30, 1917, then until June 30, 1922, 1s. 2d., and afterwards until June 30, 1925, 7d. Subsequently the difference between the West Kent and South Suburban areas is to be extinguished by 1d. annually. Thus, in about twenty years' time, uniformity of charge throughout the entire area will be reached. The area of supply is extended to the parishes of Cudham, Downe, and Halstead in Kent; and the prices in these areas will be regulated by those obtaining respectively in the Bromley and Crays areas. Protecting clauses have been accorded the South-Eastern and Chatham Railway Company, the Metropolitan Water Board, and the Kent County Council. Then we come to provisions for the supplanting of the illuminating power test by a calorific value one in all but a comparatively small area. But in that area provision has been made for effecting the change when the local authorities awake to the fact that the luminous quality of gas as a matter of importance belongs to a past age. The calorific standard, it will be remembered, is 540 B.Th.U. gross per cubic foot. Among the conditions for testing and the provisions as to penalties, the following appear:

> Not more than one testing for calorific value shall be made at any testing-place on any one day (reckoned from midnight to midnight) except that, in the event of the calorific value being on any testing ascertained to be below 447 B.Th.U. a second testing shall be made on the same day, but at an interval of not less than one hour from the time of making the first testing at that testing-place, and the average of the two testings shall be deemed to be the calorific value of the gas at such testing-place on that day.
>
> If on any one day the gas supplied by the South Suburban Company at any such testing-place is of less calorific value than 475 B.Th.U. to an extent not exceeding 28 B.Th.U. the gas examiner shall make at such testing-place a testing of the calorific value of such gas on each of the two following days; and the average of the three testings so made shall be deemed to represent the calorific value of the gas on such one day at such testing-place.
>
> Where the calorific value on any day of the gas supplied by the South Suburban Company within the specified districts is less than 475 B.Th.U., they shall be liable to the following penalties in respect of such deficiency (that is to say): Where the deficiency does not exceed 14 B.Th.U. £2; where the deficiency exceeds 14 B.Th.U., but does not amount to 28 B.Th.U., a sum not exceeding £5; for each complete 28 B.Th.U. of defective value, a sum not exceeding £10. Provided that the South Suburban Company shall not be liable to any penalty in any case in respect to which it is proved before the Justices that the defect of calorific value was occasioned by unavoidable cause or accident.

There are really few of the subsequent clauses that call for notice. It is remarked that in future all mains laid by the Company in any street are to be placed at a depth of not less than 2 feet, unless otherwise agreed between the local authority and the Company. The Company are given permission to supply power gas, with authority to the Home Secretary to make regulations. The remaining clauses are of general nature and form. The "chemical clause" appears towards the end of the Act. [*Parliamentary Agents: Messrs. Dyson and Co.*]

The Swanage Gas and Water Act is for most part a water one; and such clauses as there are referring to gas remain as when the Bill was noticed on Jan. 23 last. We will not therefore specify them, excepting to say that among them is a stand-by clause referring to both gas and electricity, and a suction-gas clause as in the Houghton-le-Spring Act. The water part of the measure will be noticed in due course. [*Parliamentary Agents: Messrs. Sherwood and Co.*]

The extension of the limits of their gas area desired by the Tendring Hundred Water and Gas Company has been allowed. Additional land powers are accompanied by the stipulation that the total quantity of land held by the Company for gas-works purposes shall not at any time, in the whole, exceed 15 acres. The

price of gas has been limited to 5s. per 1000 cubic feet, within the existing area, and 5s. 6d. within the new gas limits. In the Bill a stand-by clause appeared referring to both gas and electricity; it has, during the progress through Parliament, been limited to gas. The Essex County Council and some other local authorities have secured protecting clauses—among the latter being the Walton-on-the-Naze District Council, who have obtained the right in road reinstatement work to use a roller not exceeding 15 tons in weight. All other matters alluded to when reviewing the Bill remain in the same form. [*Parliamentary Agents: Messrs. Rees and Freres.*]

On opening the Wakefield Gas Company's Act, we are at once confronted with several pages of protecting clauses for divers bodies—local authority and railway—and it is remarked that in future the Company are to lay their mains, pipes, and culverts, so far as is reasonably practicable, at a depth of 2 ft. 6 in., measured from the top of the socket to the surface of the roads. The parishes of Crofton and the townships of Walton, Chevet, and Woolley have been added to the area of supply. In Woolley, the Company are to charge 6d. per 1000 cubic feet in excess of the sum charged in other parts of the limits of supply. In the Bill, there was a proposal to extinguish the rights of the Ossett Corporation to supply gas in Crigglestone, in which area the Company had been meeting the residents' requirements for gas. But the table appears to have been turned; and the Corporation are, on January 1 next, or at any other agreed time, to purchase the mains, pipes, and other works and apparatus of the Company within Crigglestone, and the portion of the undertaking within Ossett. The price that Ossett is to pay the Company is £1100, authority to borrow which is given to the Corporation, with power of repayment within forty years. The right to lay a trunk main along a portion of the main road leading from Wakefield to Barnsley is given, in order to enable the Company to supply within their outer limits. In the clause referring to lands and works, the "chemical clause" has been included. Other powers sought (as fully described in January last), embracing the consolidation of capital powers, and the distribution of the resulting capital, stand unaffected. As to the balance of powers conferred by the Company's Act of 1877 in respect of the raising of capital by shares or stock, these are to be exercised only by the creation of preference stock. The Company in the Bill asked for £120,000 of additional 5 per cent. capital. But they have only been allowed £30,000; and they are not to raise any of this money until they have borrowed on mortgage, or raised by the issue of debenture stock, the whole of the sums they are authorized to borrow by the Act. Inclusive of the sums already borrowed under previous Acts, the Company may borrow up to one-third part of the capital authorized, including premiums, as well as up to one-third part of the additional capital authorized under the Act. The standard price has been put at 3s., and the sliding-scale has been adapted to the 5 per cent. stock. The Company are not to charge the Corporation or the Stanley District Council more for gas than the price charged by them in the same year to any other consumer of gas for lighting. The 13 candles proposed as the illuminating power standard has been raised to the regulation 14 candles. Three testing-places are prescribed—the one provided by the Council at the Town Hall, or which may be provided by them at some other place situate within a distance of 1000 yards from the existing works; the testing-place at the works; and any testing-place provided at the expense of the Stanley District Council within their own area. No test is to be made at the last-mentioned place except by a gas examiner appointed by the District Council, or by the Justices on the application of consumers of gas within that district. The Company are, within two years, if required by any consumer of gas (other than a consumer by prepayment meter), to supply and fix free a sufficient number of flat-flame burners suitable for gas of the prescribed illuminating power (14 candles) in substitution for flat-flame burners now in use. Within a period of three months, the Company are also to change the flat-flame burners of the prepayment meter consumers. The stand-by clause relating to both gas and electricity has been allowed. The 8d. per 1000 cubic feet proposed for the hire of prepayment meters without fittings has been changed to 6d. The Company have received authorization to put into force a scheme of profit-sharing. There are not any other changes worth mention. [*Parliamentary Agents: Messrs. Torr and Co.*]

The Act authorizing the amalgamation from Jan. 1 next of the Wandsworth and Putney, the Mitcham and Wimbledon, and the Epsom and Ewell Gas Companies possesses features that were not in the Bill when reviewed on Jan. 23 last. The position of the capital of the three undertakings was then described; and there is nothing fresh about the amalgamation clauses to which we need draw special attention. The "chemical clause" has been attached to the one dealing with the general purposes of the Company. The capital of the Company has been placed at £1,362,471, divided as follows: £923,179 representing the amount of the paid-up capital (including premiums amounting in the whole to £79,468) of the amalgamated Company; and £439,292 (referred to in the Act as unallocated capital), representing the balance of the authorized but unissued capital of the amalgamated Companies. The allocated capital excluding premiums, is to be divided as follows: £393,711 of Wandsworth "A," "B," and "C" ordinary stock; £352,000 Wimbledon stock; and £98,000 Epsom ordinary stock. The amalgamated Companies are given the unallocated stock of the Companies as new ordinary stock or new preference stock. On the unallocated capital, the dividend is to be 3½ per cent., subject to the sliding-scale provisions as governed by the standard price and the price charged in the Wandsworth limits. The Company are allowed to borrow £328,749 (inclusive of the aggregate sum of £155,496 borrowed by the amalgamated Companies); being £182,318 in respect of allocated paid-up capital, and £146,430 in respect of the unallocated capital. At the instance of the Rural District Council of Croydon, the Company are under obligation not to close the existing Mitcham works of the Wimbledon Company for a period of five years from the date of the amalgamation. As to the laying of future mains, the new clause reads as follows: "From and after the passing of the Act, all mains laid by the Company in any street shall be laid at a depth of not less than 3 feet, unless otherwise agreed between the Company and the local authority, and, in the case of any main or assisted roads, or country and main road bridges in the Administrative County of Surrey, the Council of that county. The present standard price in the Wandsworth and the Epsom limits is (as at present) 4s., and within the Wimbledon limits 3s. 2d. The following provisions apply to the charges for gas:

The actual price to be charged by the Company for gas supplied by them shall be reduced to 2s. 2d. per 1000 cubic feet within the Wimbledon limits, and to 2s. 6d. per 1000 cubic feet within the Epsom limits before the price within the Wandsworth limits is reduced below the price of 1s. 9d. per 1000 cubic feet. Any reduction in the price of gas under the preceding provision within the Wimbledon limits and the Epsom limits respectively shall be in the proportion of 2d. within the Wimbledon limits for every 3d. within the Epsom limits. When the price charged by the Company within the Wandsworth limits is 1s. 8d. per 1000 cubic feet, the price within the Wimbledon limits shall be 2s. per 1000 cubic feet, and within the Epsom limits 2s. 5d. per 1000 cubic feet. When the price within the Wandsworth limits is 1s. 7d. per 1000 cubic feet, the price within the Wimbledon limits shall be 1s. 10d. per 1000 cubic feet, and within the Epsom limits 2s. 4d. per 1000 cubic feet. If any increase shall at any time be found necessary in the price of gas, such increase shall be of the same amount throughout the whole of the limits of the Company.

Then an interesting feature often referred to during the parliamentary progress of the Bill is the calorific power clauses, which displace illuminating power testing as the standard of quality and for penalty purposes. The chief provisions are the following:

As from the 1st day of January, 1913, the standard calorific power of the gas supplied by the Company shall be 166 calories gross per cubic foot (the expression "calories" being used in this Act as meaning calories gross per cubic foot); but the Company shall not incur any liability in the event of their supplying gas of a calorific power of not less than 122 calories.

One testing only for calorific power shall be made at each testing place on any one day. But in the event of the calorific power being on any testing ascertained to be below 115 calories, a second testing shall be made at an interval of not less than one hour from the time of making the first testing at that testing-place; and the average of the two testings shall be deemed to be the calorific power of the gas at such testing place on that day, and the gas examiner shall forthwith give notice of the results of such testings to the Company.

If on any one day the gas supplied by the Company at any such testing-place is of less calorific power than 122 calories to an extent not exceeding 7 calories, the gas examiner of the local authority shall (if the local authority contemplate proceeding for a penalty) make at such testing-place a testing of the calorific power of such gas on each of the two following days, and the average of the three testings so made shall be deemed to represent the calorific power of the gas on such one day at such testing-place.

The Company shall not be liable to any penalty for defective calorific power where the calorific power on any day of the gas supplied by them at any such testing-place is not less than 122 calories; but where the calorific power on any day of such gas is less than such last-mentioned quantity, the Company shall be liable to the following penalties in respect of such deficiency—that is to say, Where the deficiency does not exceed 3½ calories, £2; where the deficiency exceeds 3½ calories, but does not amount to 7 calories, a sum not exceeding £5; for each complete 7 calories of defective power, a sum not exceeding £10.

For the purposes of this section, section 33 of the Gas-Works Clauses Act, 1871, shall be construed as if calorific power were therein referred to in addition to illuminating power and purity, provided that the Company shall not be liable to any penalty in respect of any testing for illuminating power.

Power is given the Wandsworth Town Council to have an additional testing-place at the Wandsworth Town Hall. In protecting clauses for the Epsom Council, as stated when noticing the Bill, the Company are to maintain tanks in which all liquor resulting in or from the manufacture of gas or other product shall be collected and treated, so that it shall be rendered harmless to the material of which the sewers and sewage-collecting tanks of the Council are constructed, and to the land on the sewage farm and the bacteria beds and the works thereon." There are a considerable number of details in the measure that are essential but do not call for special notice here. [*Parliamentary Agents: Messrs. R. W. Cooper and Sons.*]

The York Gas Company (which is the future title of the concern) have secured the large territorial extension that they sought; and in this connection protecting clauses have been incorporated in the Act in favour of the West Riding County Council and the Rural District Councils concerned. The general purposes clause of the Company appears in the old form, which gives them power to "provide, produce, sell, dispose of, and deal in gas coke, tar, and all other residual products resulting from the manufacture of gas." But later on the "chemical clause" appears, which puts a limitation on the full exercise of the foregoing powers. There has been a slight reduction of the capital that was mentioned in

the Bill as noticed on Jan. 23. Then it was suggested that the capital should be £500,374, of which £80,000 was proposed as additional capital. The capital is now £483,374, of which £63,000 is additional capital. The £10,000 of capital created under the Company's Act of 1898, but not issued, is cancelled. The dividends allowed are 4 per cent. on the "A" preference stock; on new additional capital issued as preference shares or stock not exceeding 5 per cent.; on the consolidated stock, 4 per cent.; and on any other ordinary stock issued under the powers of this Act, 6 per cent. The borrowing powers quoted when noticing the Bill have been secured. Additional land for gas-works purposes have been allowed. The Company are to plant along one side of part of the described land a belt of quick-growing trees to screen from certain houses the works which may be erected on part of the land. It was proposed in the Bill that the standard price should be 2s. 10d. But the Company offered a considerable concession from this; and eventually, against their opposition, it was put down to the low figure (in the defined "inner" area) of 2s. 3d., with movements of the dividend in respect of any one year varying by 2s. on the consolidated ordinary stock, and by 3s. on the additional ordinary paid-up capital. In the outer area, the price charged for gas is not to exceed 6d. per 1000 cubic feet. The illuminating power and other clauses remain as in the Bill. The Company are within one year after the passing of the Act, if required by any consumer, to supply flat-flame burners suitable for the prescribed illuminating power (14 candles) in substitution for those in use by him. Electricity has been eliminated from the stand-by clause. The purchase clause that was inserted during the latter stages of the Bill is as follows: "If the proprietors of the Company shall, at a meeting to be held on or before the 1st day of October next, after the passing of this Act, approve of the sale of the undertaking to the Corporation, on the terms specified in the third schedule to the Act," the Corporation shall introduce in the next session of Parliament the necessary Bill to empower purchase. The schedule provides for the Corporation paying to the Company a sum equal to £102 10s. per cent. for the £370,000 ordinary and the £50,000 preference stock. The sum of £5000 is to be paid the Directors for compensation. Terms are included for the compensation on the Treasury scale of officers who are not retained in the service. The clauses proposed in the Bill relating to the recovery of money due, and to people interrupting the workmen in the discharge of their duty, have been deleted. [*Parliamentary Agents: Messrs. Durnford and Co.*]

ELECTRICITY SUPPLY MEMORANDA.

Minor and Major Breakdowns—Greater Reliability at all Cost—Electric Gas-Producers—The Municipal Trader and the Private Heavily-Rated Trader—Position of the Gas Company in Relation to Municipal Trading—Loss on Artizans' Dwellings—Metallic Filament Lamps in Street Lighting—A Despicable Action at Newmarket.

THE serious breakdowns in electricity supply which have attracted an amount of public attention that is very distasteful to our electrical friends are stirring-up the latter to more open recognition of this innate weakness of their service, though naturally they minimize it as much as possible, and affect a belief that the gravity of the interruptions of supply is not so great as the sufferers from them feel, and as it is—particularly from the public point of view. The "Electrician" has had a little homily on the subject, and has dealt with the subject fairly and broadly, though minimizing the importance on the one hand, and showing a profound appreciation of the importance on the other. The homily has its two sides. It starts with a reminder of the paper on the reliability of electricity supply read by Mr. F. Ayton at the last meeting of the Incorporated Municipal Electrical Association, and says that probably most of those who attended the discussion on the paper felt that the days of really serious interruptions were over. If there were really any who so thought, then they were relying for support on a reed, the fragility of which was soon to be demonstrated. Many central station engineers, on reading the homily, will feel, before reaching the end, that their competence as engineers, and their assurance as to the sufficiency of their equipment at and in the precincts of the switchboard, have been bluntly assailed. But to follow the course of the article. It says that several of the breakdowns have been minor ones; and it goes on to show that there are many seats of disturbance in the electricity supply system away from the switchboard. The writer cites a few of the "minor" occurrences; and while he does "not suggest that there have been no interruptions of consequence," he does not specifically mention more than the Lot's Road one. The minor occurrences referred to commence with a failure at Eccles, which "resulted in inconvenience to a few consumers for three hours;" and the Town Hall and a political meeting were involved. Is not that enough to give a bad name to electricity as a source of reliable lighting? A short-circuit at Derby resulted in "a small portion of the system (amounting to less than 10 per cent.) being dead for about twenty-minutes." Then again at Glasgow, there was a shut-down of two sub-stations for five minutes. At Scarborough, too, a failure was limited to a small sub-station. Memory does not have to be seriously charged to bring to mind a much more serious breakdown at Glasgow. However, these are all interruptions that can do no good to electricity supply; and they are matters of public importance, which description is not affected by the sneers—not of this particular writer, but of one other in the electrical press.

We leave these recent "minor" occurrences, for those that have major importance. Recent ones include the Lot's Road generating station failure, Islington, and Ilford; and a little distance ahead of these was Liverpool. These, without (save Lot's Road) being specifically named, are the ones that induce our friend to say "if electric power is to retain its good name, such interruptions must be prevented at all cost." It is a question whether the "good name" of electricity has not already received a severe blow in those localities where the consumers have felt the unreliable character of the service. The breakdowns at central stations suggest the possibility to the "Electrician" writer that some engineers have been relying upon old types of switchboard and switchgear." There is the current transformer; and this weak spot, we are told, has been responsible for more than one breakdown at Lot's Road. Then there is the recognition of the danger of bitumen covered cables, which supply, with the electric energy, all the requisites for highly inflammable gas production, which has been the source of many troubles that have been laid on the broad back of the gas industry. And this brings us to the charges of want of realization, and of the short-sighted policy, on the part of central station engineers, and an invocation to shake off sloth, and early rise to the production of something of a higher standard of protection in switchboard practice. This is what is said by the "Electrician:"

> What does not seem to be realized quite as fully as it should be is that if an arc, with a good deal of power behind it, starts from a rubber-covered or bitumen cable, we have at once a gas produced of a highly inflammable kind. It is a veritable gas-producer, from which the flame cannot be extinguished as long as the arc is in action. It is therefore most important that the whole of the switchboard and the cables in its neighbourhood should be fireproof It is only short-sighted policy to continue running a station with an old-fashioned switchboard having a multitude of connections covered with inflammable insulation; and steps should be taken by the responsible engineer to replace such plant at the earliest possible moment. Such a replacement may seem expensive; but it is much cheaper than having a serious breakdown and consequent replacement at short notice.

So say all of us. It will, however, be interesting to observe if the homily has effect, and whether in future, as a result, those members of the community who rely on electricity supply from a central station for any purpose whatsoever, and the public generally, who are compelled by municipal directors of electricity supply stations to have dependence upon electricity for public lighting, will be relieved of the objectionable inconvenience and danger which have been so freely illustrated of late. Is it not time, too, after the Long Acre experience, and the Nottingham, Strand, and many other explosions, as well as fires and interruptions of electricity supply—all produced by the electric gas-producer—that our electrical well-wishers used pebbles instead of bricks when attacking rivals from the glass house in which they reside?

More than one municipal electrical authority have of late been considering the question of transferring their electricity services into the custody of private enterprise. Some have actually done so; and, indeed, it would have been much better for the whole community if, where private enterprise in gas supply exists, private enterprise in electricity supply had also been set up. Competition between the two would have been much better for all than the vicious competition which obtains so widely at the present time, and which enables, in many ways, the municipally conducted electricity business to ride roughshod over the privately conducted gas business. In a town there is free trading in most commodities; but where there is municipal electricity, free trade is not allowed to have full swing, but has to stop short at all points where the municipal authorities can put up a barrier against gas, and so injure one of their best ratepayers, and one of the best employers of labour in their area. If municipal councillors, in their own businesses, could be subject to such municipal competition, it would be one of the most effective means of putting an end to this sort of thing. If, for instance, a town councillor who is a coal merchant, a butcher, a baker, a greengrocer, or a dealer in any other commodity had the municipality setting up an opposition business, and supplying all the local institutions with his own particular commodity, thinks anyone that there would not be a deafening and wholesome outcry against municipal competition? We often wish that a lesson of the kind could be applied. Less would then be heard about the righteousness of dealing at the municipal "shop" when electricity is spoken of; less would be heard of the pleading from electricity supply committees to the ratepayers to deal at their (so-called) own shop, in which they do not feel that they have a particle of possession. The electrical contractors have been loud in their protests against municipal electricity departments dealing in wiring and fittings. And those members of municipal councils who are electricity contractors are foremost in passionately declaiming against the iniquity of this sort of thing. Do they think the private gas enterprise does not feel the same sentiments as they? Yet gas undertakings are not allowed a vote or a voice in these matters; but the municipal electricity traders are.

The point has been illustrated frequently as to the antagonism of private traders to municipal adventure when this affects their own pockets. One of the latest instances is found in the proposal of the Leeds Corporation Electricity Committee to borrow £10,000 for the purchase of electric-motors for letting on hire. The

project raised a storm of indignation in trading circles in the city; and the Council have agreed, by a "large majority," to the matter being referred back to the Committee, with the view of giving the local traders an opportunity of laying before the Council a scheme of their own. The local Chamber of Trades' Council have had the matter under consideration; and local trades councils of the kind are bodies whose views city and town councillors cannot afford to ignore. The Leeds Chamber lately passed a resolution declaring an adamant objection to the Council inaugurating experimental trading in electric motors, and expressing the view that "it would be an injustice to the ratepayers if they were called upon to provide capital for experimental municipal trading which would, in many cases, ruin those same ratepayers connected with the trades and industries subjected to a competitive system of this character." What about gas companies? There are councillors who will vote, with feelings of pious indignation and resentment, against any proposal of the municipal council that affects their own personal business; and yet these same men as members of the local authority—where gas companies exist—will vote in favour of the street lighting and the trade in the supply of gas to all public institutions being filched from the gas company, though the gas company can show greater economy, a better quality of light, and greater efficiency. The gas company are ratepayers, and large ones; and they are traders willing to run on commercial and competitive lines. Such men as those to whom we refer—rising in indignation when self is the object attacked, and willingly voting in favour of the municipal electricity department when a gas company is concerned, and their own pockets are not—are the most unprincipled of filibusters. The President of the Leeds Trades' Council stated, when submitting the resolution to which we have referred, that there were "many forms of unfair trading springing up, which were making it most difficult for the *heavily rated traders* to carry on their various businesses." Gas companies agree that the unjust curtailment of the freedom in competition—a curtailment imposed by municipal despotism—of one of the heaviest rated ratepayers in any city or town is really a difficulty of no mean order. The Leeds Chamber thought the time had arrived when strong representations should be made to the Local Government Board on the subject of the extension of municipal trading, because they do not regard this electric-motor hiring proposition a good municipal business. There is likely to be a strong representation of traders at the local inquiry, if eventually the City Council determine to apply for the £10,000.

We were mentioning the subject of municipal electricity concerns being transferred to private enterprise. The ones that are transferred are those that are not making a brilliant show under municipal management. Barking is one of them; and Barking is willing to consider an offer for the purchase of their undertaking. Meanwhile, the Electricity Committee have been considering a revision of the tariffs, so as to realize a larger income. Their proposal was that the lighting charges should be increased from 4d. to 4½d. per unit; that the charge for power should be raised by ½d. per unit on the scale charges; and that the charges for electricity in the King Edward's Road artizans' dwellings should be raised to "1s. and 8d." per week per house, with the option to the dwellers to have ordinary meters. The Electrical Engineer has also been ordered to instal one metallic filament lamp per year in these houses; so that, if a tenant has five lamps installed, they will be municipally renewed once in every five years. The Council have resolved that the ordinary private consumers are not to pay the extra charge per unit proposed; but the artizans are to pay the additional price that the Committee recommended should be imposed upon them. As this price only includes lighting, and not a cooker and the convenience that gas offers for boiling, the artizans, in their own interests, will perhaps apply at once to the Gaslight and Coke Company—if the artizan's dwellings in question are not tenements in which electricity is the only means of illumination allowed—and have the convenience of lighting and much else for the sum the Council are now charging them for light alone, and that a poor light if the prescriptions for artizans' dwellings that we have seen elsewhere apply to the Barking ones. On the electricity supply to these dwellings alone, the Council last year lost no less than £250; and as loss is teaching them the evil of speculation, there is not much likelihood of this particular concern entering further into this line of business. The business proposition before electricity committees is how to supply with lighting fittings, and with a cooker and means for boiling (which cooker and means must have a long life), the equivalent of nearly 30 cubic feet of gas for 1d., and all inclusive, with no charge against the consumer for renewals, excepting two or three coppers occasionally for a mantle. They cannot do it. Meantime, the Barking Electricity Committee are not indisposed to consider an offer for the purchase of the undertaking.

The original estimates of some electricians as to the candle power of metallic filament lamps, that will give as good satisfaction as incandescent gas-lamps in streets, are when materialized often found to be sadly wanting. It is history now how in parts of Marylebone there has been complaint, and the Electricity Committee have been compelled, by the force of discontent, to put up higher power lamps. In Hampstead, the ratepayers were grievously disappointed with the illuminating result of the manœuvring that took place to bring about the transfer of the street-lighting from company supplied gas to municipal supplied electricity, and with the cost in which they were involved for producing inefficiency. Lamps of stronger power had to be established. Now we see that the present 70 and 110 watt lamps in seventeen roads in Marylebone are to be changed for lamps consuming 160 watts per hour—that is to say, the 70-watt lamps are to be replaced with lamps consuming 90 watts per hour more and the 110-watt ones with lamps using 50 watts per hour more.

While on the subject of public lighting, we must congratulate the Newmarket Gas Company on the resolute attitude they took in the fight for the street-lighting contract, and which has placed in their hands a contract for a further ten years. The electrical people have now before them a long spell for reflection over certain features of this recent fight. They engaged Mr. Haydn Harrison to make tests of certain street-lamps; and if these tests included gas-lamps, we take it they were the old pattern lamps that had been doing duty during the run of the current contract, placed against new metallic filament lamps. The Council refused to recognize the tests. We, nor (we assume) they, cannot get away from the fact that the tests were made, without an expert being present to check them on behalf of the Gas Company, by one who is a pronounced electrical man. The Gas Company put up samples of new gas-lamps, and offered to have them tested as well as the electric lamps, at their own expense, also by a photometrical expert. Fairness characterized the Gas Company's action all the way through the contest. Then someone in the electrical interests—despicably underhanded—sent out an anonymous and undated circular charging the Gas Company with supplying the ratepayers with less than half the illuminating power in the streets that they were under contract to furnish. The Gas Company were not prepared to allow this charge against their commercial integrity to go unheeded; and their Solicitors offered £10 reward for information that would enable them to fix responsibility for this anonymous libel, with the view to proceedings. If the person responsible for this act was confident that his charge was true, he could have shown his courage by coming forward, and defending his assertion in a Court of Law. The gas industry is just about sick of some of the commercial tricks of not a few business folk. The latter seem to be particularly adept at trade slander; but the law provides the means for bringing them to book. We are glad the Newmarket Gas Company took action in this matter; and hope other gas companies will show themselves equally strong in bringing such traducers to book. Up to the time of writing, the electrical papers have not had anything to say about this success of gas at Newmarket. And why? Perhaps they think the less said, the soonest will be mended the disgraceful anonymous tactic which the Gas Company very properly resented. They cannot surely be proud of such hitting below the belt. More was said as to the Gas Company's contract a fortnight since in our "Miscellaneous News." Later in the same issue, under the head of "Triumphs of Gas," there was given the opinion of Professor C. Vernon Boys, F.R.S., that Victoria Street, Westminster, is now unquestionably one of the best lighted thoroughfares in the United Kingdom; and he adds: "I always considered money spent in gas, by people who knew how to use it, the best money spent at all."

MODEL BILLS AND CLAUSES.

Important Amendments.

THE Model Bills and Clauses as amended for next session were issued on Monday last week. They differ in several respects from those published this time last year, mainly as the result of recent changes in legislation.

Dealing with the Gas Bill first, it is stated at the outset that the Gas-Works Clauses Act, 1847, is incorporated, with the exception of section 7; and it is pointed out that the effect will be to authorize the breaking-up of private streets for the purpose of laying pipes. According to clause 5, the company is to be established for the purpose of manufacturing and supplying gas for lighting, heating, motive power, and other purposes, within the limits of the Act, and power is given to "convert, manufacture, and sell all residual products resulting from the manufacture of gas by them, and generally may carry on the business usually carried on by a gas company." In a footnote is given the text of the restrictive clause in this matter recently inserted in some Gas Acts. In the clause dealing with the construction of works, it is specified that the company may do all such acts as may be proper for making and storing gas and for supplying gas within the limits of the Act, and may, on the lands specified, "manufacture and convert all residual products resulting from the manufacture of gas by them."

In the preceding Model Bill, the following clause, giving power to lay pipes in private streets, was inserted:

> The company may, on the application of the owner or occupier of any premises within the limits of this Act abutting on, or being erected in, any street laid out but not dedicated to public use, supply those premises with gas; and for that purpose the Gas-Works Clauses Acts, 1847 and 1871, shall apply as if the street were a street within the meaning of those Acts."

As the clause now stands, the concluding portion reads as follows: "And for that purpose the Gas-Works Clauses Act, 1847, shall apply as if section 7 of that Act were excepted from incorporation in the Act of ." It is explained that this clause may be used in cases where the section specified is incorporated in a previous Act, but it will be unnecessary where there is no previous Act, or

where the Act is repealed, if the Bill excepts the section from incorporation.

There are some changes in the clause relating to the charge for gas supplied by means of prepayment meters. The principal portions now stand as follows:

> The charge for the hire of any prepayment meter and fittings to be used therewith shall be a sum of money calculated according to the quantity of gas supplied through the prepayment meter; and the maximum charge shall be at the rate of 10d. per 1000 cubic feet supplied in manner aforesaid, such sum to include the hire of meter and the fittings used therewith, or at the rate of 1s. per 1000 cubic feet if such fittings include a cooking-stove.
>
> The charge for the hire of any prepayment meter without fittings shall be a sum of money calculated according to the quantity of gas supplied through the prepayment meter; and the maximum charge shall be at the rate of 6d. per 1000 cubic feet supplied in manner aforesaid, or at the rate of 10 per cent. per annum on the cost of the meter, whichever shall be the higher.
>
> The said charges shall include the providing, letting, fixing, repairing, and maintenance of the meters and fittings or of the meters (as the case may be) and the cost of collection and other costs incurred by the company in connection therewith.

It is pointed out that this clause is not required where section 13 of the Gas-Works Clauses Act of 1847 is amended as is done in clause 1 of the Model Bill.

In clause 31, as amended, the 24 hours' notice to be given to a company by a consumer before he quits any premises supplied with gas, is to be "either personally at the office of the company or in writing." A similar condition appears in clause 33 in regard to the notice to discontinue the supply.

There is a new clause bearing upon a company's failure to supply. It specifies that if after the expiration of five years from the passing of the Act the company have not laid down mains for the supply of gas in a particular district, the local authority of the district, or any company or person, may apply for an Act or Provisional Order for the purpose of providing such a supply, and for the repeal of the powers in this behalf of the defaulting company.

The former Model Bill relating to water supply has been amended in a few particulars. The clause relating to the making of bye-laws for preventing the pollution of water is omitted. The notice of discontinuance of supply is to be left at, sent by post to, or given by the consumer personally at, the office of the company or corporation. In the clause giving power to sell meters, it was formerly specified that the provisions of section 14 of the Water-Works Clauses Act, 1863, should extend to authorize the company or corporation to let for hire any fittings to any person supplied by them with water. These words are omitted from the amended Model Bill. In the clause authorizing the making of contracts, it is provided that nothing contained therein is to sanction the laying of mains beyond the limits of the Act. In clause 24, power is given to the local authority to apply to Parliament for power to supply water in the event of the company failing to adequately do this.

GAS WATER-HEATING AT MAGDALEN COLLEGE.

An Installation for the Prince of Wales.

Many interesting facts have appeared in the newspaper press during the past few days with reference to the arrangements made for the reception of the Prince of Wales at Magdalen College, Oxford, where he went into residence last Friday for a year. But, in addition to these, there is one which brings the event within the purview of our columns. A suite of four communicating rooms has been tastefully decorated and furnished for him in Cloister IV.; and one of them had to be specially adapted for the use to which it has been put. The preparation of the two sitting-rooms and the bed-room presented no special difficulty; but with regard to the fourth—the bath-room—the matter was different. The ordinary bath-rooms are all situated in one particular part of the College; and when it was determined that the Prince should have a bath-room included in his own suite, the Architect was faced with the problem that there was no supply of hot water close at hand. It was necessary, therefore, to put in a complete installation of water-heating apparatus. To have put in a coke-boiler, in accordance with the usual custom for the general supplies, would have meant the building of a stoke-hole; but there was actually no room available with a flue which could be devoted to heating apparatus on that system—the bath-room being quite surrounded by occupied apartments.

It was in these circumstances that Messrs. Benfield and Loxley, an Oxford firm of builders, suggested that Mr. Thomas Potterton, of Balham, should be consulted; and the result is the provision of as neat and serviceable an installation of water heating and water-heated appliances as could possibly be desired. A scheme was worked out by Mr. Potterton's firm to meet the requirement that the whole of the plant should be confined to the bath-room—the utmost being made of the limited space at disposal; and the arrangement accepted by the College authorities affords testimony to the adaptability of this particular method of heating water by gas, as well as to the ingenuity of those who planned the installation. The existing fire-grate in the room was removed, and in the recess (which is about 3 feet high) sufficient accommodation was found for the water-boiler and the storage, placed horizontally. In fact, one of the special features of the apparatus is that the cylinder and boiler are on the same level, instead of the storage being above the boiler, as is customary. It is one of the points about the "Victor" gas water-heating system that it can be so arranged as to meet varying requirements in this way. Two doors from the edge of the mantel-shelf to the ground enclose the heating arrangements in a cabinet; and near the bottom of these doors there are two ornamental grills, which serve the purpose of ventilation. The cylinder is jacketed, so that there is no fear at all of the bath-room becoming over-heated; and altogether the installation appears to be an ideal one for a self-contained flat. The boiler employed is of the No. 19 "Victor" pattern, with a 25-gallon tank, which the hot water enters at the top; and, starting cold, water at 130° Fahr. is available for the wash-hand basin in fifteen minutes from lighting up, while enough for a good bath can be had in half-an-hour. The necessary supply cistern is fixed in the roof; and in connection with the hot-water tank a cut-out is arranged, so that a reduced quantity of water can be heated—the apparatus in this respect being exactly upon the Potterton standard system.

In addition to the water for the bath and basin, some heat was required for towels; and to furnish this, a nickel-plated horse has been fixed—the heat being also carried into a linen cupboard for airing purposes. The circulation for this—the towel-rail and the linen-airer—is quite separate from that of the storage-tank (the boiler having duplicate tappings to allow of this) so that the thermostatic control in connection with the heating of the contents of the tank is not affected by the quick results which are necessarily obtained in the towel-rail owing to the contained water being small in quantity.

Indication has been given of the way in which this little installation impressed the writer; and it now only remains to express gratification at the fact that gas has once more helped to solve a problem that would otherwise have proved a difficult one.

A NEW ITALIAN GAS PAPER.

We have received and perused with pleasure and interest a fresh addition to our foreign gas contemporaries, bearing the title of "Rassegna Italiana dell' Industria del Gas e delle Industrie Affini." This may be shortly called the "Italian Gas Review." It is a fortnightly publication, emanating from Rome, and under the management of Signor Aldo de Bartolomeis. Its introductory leading article makes suitable reference to its "elder brother"—our esteemed Italian contemporary, "Il Gaz," and observes that if Japan, with not more than six gas companies, can support a technical journal, surely Italy, with about forty, has room for an additional trade paper. It is also thought, and rightly, that the social needs of to-day, which the gas industry can fulfil, call for less superficial knowledge and more accurate information on the part of the general public. It is to be noted, further, that—with a view of appealing to, and interesting, those in the more humble ranks of gas workers—special attention will be given to their requirements; and, incidentally, reduced rates of subscription are offered to them.

The sixteen pages of the first number contain articles of merit, such as one by the Editor on the taxation of illuminating gas; and another is on the theory of water gas. Under the general descriptive heading of "Practical Lessons" is, in addition to some other articles, a short summary about the "Origins of Gas Lighting," which refers appreciatingly to the pioneer gas work done abroad by English engineers and capital. The beginnings of gas lighting in Italy are, however, not referred to at all; and it would be interesting if some Italian gas historian were to record the first developments of the industry in his country. We note, by the way, that in another article in the "Review" it is stated that Turin was the first city in Europe to adopt the Welsbach mantle for public lighting.

It will be gathered, therefore, that the first number of the "Rassegna Italiana Gas" is not without its attractions; and we offer our warm congratulations to those concerned, and express our good wishes for the future prosperity and usefulness of the new review.

We have received from the Hon. Secretary of the Midland Junior Gas Association (Mr. W. J. Pickering) the "Transactions" for the session 1911-12, reprinted from the reports of proceedings which appeared in the "Journal." In addition to the Inaugural Address of the President (Mr. R. J. Rogers), there were four papers dealing with the purification and distribution of gas, high-pressure gas, and internal fitting work, and four valuable lectures on "The Production of Power from Gases," by Professor F. W. Burstall, M.A., of the University of Birmingham. The work of the session included four visits; one being to London, where, as the result of arrangements made by a Sub-Committee of the London and Southern District Junior Gas Association, the visitors were able to inspect the subways of the City, under the guidance of Mr. W. J. Liberty, a member of the Committee. The proceedings of the session occupy about 160 pages; and they are preceded by a list of the officers. The pamphlet contains a record of good and useful work.

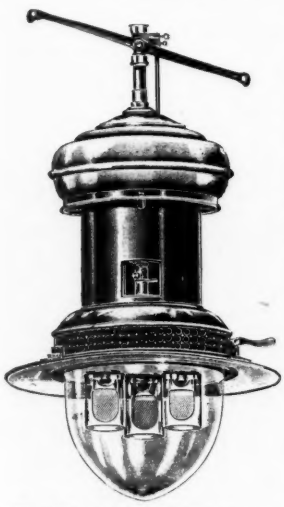
THE BIRMINGHAM GAS DEPARTMENT NEW SHOW-ROOM.

In connection with the illustrations accompanying the paper read by Mr. George Clarry, of Cardiff (see pp. 192-3 of this issue), at last week's conference of the British Commercial Gas Association, the above general view of the Birmingham Corporation Gas Department show-room at the new offices in the Council House will be of much interest.

The photograph is reproduced, by permission, from the Birmingham Gas Department Magazine.

THE "EZOL" HIGH-POWER LAMP.

So far as there has been opportunity of observing, the current lighting season, as has already been remarked in the pages of the "Journal," has brought a very busy time to both makers and sellers of gas lighting appliances; and the works and warehouses of the Wholesale Fittings Company, Limited, of Commercial Street, E., add yet one more instance to the activities noticed elsewhere. But if business is good, there is nevertheless a continual desire manifested on all hands to further improve the articles that are offered to the public; and in this respect also the firm referred to are no exception to the rule.



The "Ezol" High-Power Low-Pressure Lamp.

Among the novelties and improvements which the Wholesale Fittings Company are introducing on the present occasion, mention may first be made of the "Ezol" high-power low-pressure lamp, on the 1912 model, which is the latest development of this well-known series of outdoor lamps. Made of the best material, heavily enamelled, and storm and rainproof, the lamp (which can be supplied with one, two, or three burners) is eminently suitable for the lighting of large areas, such as railway stations, docks, shop-fronts, &c., where a bright illumination is essential. As the approximate illuminating power of the lamp is reckoned to be 300-candle power per burner, with a consumption of 7 cubic feet of gas per hour, this gives a total lighting for the largest size of somewhere about 1000 candles. In order to ensure the supply of a sufficient quantity of air to produce a proper bunsen flame, ample provision is made for its introduction through a number of holes round the lower part of the metal casing, as well as at the inside edge of the reflector. A reliable flash bye-pass is fitted to the lamp; but as the burners are made with a shut-off arrangement, it is not necessary in the larger sizes to have the two burners or the three burners alight at the same time. As a further means of securing the right proportions of gas and air, a sort of mid-feather has been introduced in the burner-tube. The idea of this is to divide up the gas into two streams; and it has been found to give very good results. The removal (which is accomplished in a few seconds) of the reflector and patent bottom plate with flues attached, enables the whole of the interior of the lamp to be got at for cleaning and other purposes. The centre portion of the lamp body consists of a revolving sleeve, which has in it an opening fitted with a door. This sleeve can thus, of course, be turned until the opening is opposite the regulators of the particular burner which it is desired to attend to. The gas and air regulation can in this way be adjusted with a minimum of trouble.

To refer briefly to one or two other lighting appliances seen in the firm's show-rooms, there is the "Bonbac" high-power inverted lamp for interior illumination. This, it is claimed, can give a reflected light of about 300 candles, with gas at ordinary pressure. The gas and air regulators are fitted with long arms, so that they may be handled under all circumstances without discomfort; and there is a set-screw to obviate injudicious tampering with the gas-adjuster when once its proper position has been determined. Though moderate in price, the lamp is a serviceable looking article; and it is decorative, too—finished, as it is, in white enamel with gold lines. Then, for places where an upright burner may be preferable to use, although the effects as far as possible of an inverted light are desired, there is the "Bonbac" shadowless "C" burner, fitted with a Jena glass gallery, so that a downward light is not obstructed, while the upward illumination of the upright burner is retained. There are holes in the gallery and in the chimney which fits on to it; and the burner, which takes "C" glass and mantles, has a non-corrosive steatite head. A two-light factory lamp with special gas and air regulators, stopcock levers and chains, and a 12-inch green enamelled hood and reflector, strikes one as having been successfully designed to withstand hard wear. Each of the burners is entirely separately controlled.

The Company stock a varied assortment of beaded shades, and there are noticed many tasteful patterns of etched glass shades fitted with bead fringes.

AN ENCOURAGING COMMUNICATION.

Mrs. M. A. Cloudesley Brereton has forwarded for publication the following letter, which will appear in the next issue of the "British Commercial Gas Association Bulletin"—thinking it might be of interest as showing that good is already resulting to the movement from last week's conference at Manchester.

The First Conference of the British Commercial Gas Association.

To the Editor of the "Bulletin."

Madam,—As one to whom the "B.C.G.A." kindly extended an invitation to attend its first annual conference, may I ask your special indulgence in stating through your valuable paper how much that invitation was appreciated and enjoyed; also how greatly surprised I was by the general tenor of the great gathering, and its admirable business-like methods, which will, undoubtedly, have very far-reaching effect.

It may be in the recollection of some of the officials of the Association, that at the first meeting of a provisional nature called by Mr. Alderman Phillips in the Salford Town Hall, it fell to my lot to disagree, and to speak rather disparagingly of the proposals then made; for it appeared to me to be very largely a matter that would concern private undertakings—such as the manufacturers of gas appliances, and makers of gas engineering plant—and not the municipal gas-works of our various corporations.

Any unprejudiced individual present at the reading of those admirable papers (more especially those by Mr. G. Clarry, of Cardiff, and Mr. H. H. Creasey, of London), could not fail to be convinced by the results which they, as well as Glasgow, have achieved by their assiduous and determined application to this all-important subject. Their records are marvellous. Their personal experience—and it is this personal note which has thoroughly converted me—after years of struggle amidst the scepticism and opposition of such enormous interests, proves beyond question that it is the duty of all who desire gas in its many and varied forms of use to take its proper place to see that no stone is left unturned in bringing before our great communities the advantages which have arisen from the using of gas for all domestic and household purposes.

Through my attendance at their conference meetings, my opinions are entirely revolutionized; and in the future, as far as possible, all my efforts and energy will be on the side of the "B.C.G.A.," and my endeavour will be to bring all the persuasion in my power upon the corporations, wherever possible, to bring them into line with its admirable and exemplary work.

I remain, Yours respectfully,

(Signed) O. O. Noel,

Chairman of the Mossley Corporation Gas-Works.

Scout House, Mossley, Oct. 9, 1912.

Accompanying the letter is a copy of a telegram, as below.

Oct. 11, 1912.

Glad say Chairman and Committee converted as result magnificent meeting. Have decided to subscribe.—Taylor, Mossley.

MANCHESTER UNIVERSITY LECTURES.

The Syllabus for the Current Session.

The first of the lectures arranged to be given this session at the Manchester University, under the auspices of the Manchester and District Institution of Gas Engineers and the Manchester and District Junior Gas Association, was delivered on Saturday afternoon by Mr. E. J. Evans, B.Sc., Manchester, who had for his subject "The Physics of the Incandescent Mantle." There was a large attendance of members of the Junior Gas Association, and also several from the Senior organization, including Mr. Samuel Glover, of St. Helens, the President, who officiated as Chairman of the gathering.

After a brief introduction by the Chairman, Mr. Evans delivered his lecture, a report of which will appear in an early issue of the "Journal," time being required by the lecturer for the preparation of diagrams, &c., so that his remarks on the subject may be the better understood by those not present.

Mr. D. V. Hollingworth (President of the Junior Gas Association), in moving a vote of thanks to Mr. Evans, at the conclusion of the address, pointed out that in the arrangement of these lectures, session by session, it had been the aim of the Sub-Committee to have them in such sequence that each should have some sort of bearing upon the one given previously. They began with the chemistry of flame, and this led up to the application of gas for lighting and heating. The blending of the purely scientific side with the practical could not but enrich their proceedings when printed in the "Transactions." In this connection, it must be remembered that these lectures were intended to form a sort of treatise on the subject, to which members could refer when in difficulty. He was quite sure the lectures they had already had would form one of the most valuable treatises on the subject that it was possible for them to get hold of. Further, it should not be forgotten that these lectures brought together the highly trained scientific men at the University and the keenly practical men who were connected with the gas industry. The result of this must be to benefit the whole of the members of both Associations, and consequently the industry they represented. He could not agree to the suggestion made in certain quarters that the lectures were too highly scientific.

Mr. J. Alsop (Hon. Secretary to the Junior Association) seconded the resolution.

The Chairman, in supporting the vote, expressed the pleasure it had afforded him to listen to such an interesting lecture dealing with the breaking-up of light. The last word had not yet been said on this subject in its application to the utilization of gas. Though a good deal had been done since the wonderful discovery of Welsbach in 1885, all had not been accomplished that might and could, he believed, be. He was sure there were some things in Nature in relation to this matter that were not yet within their ken; and if the lecture that afternoon stimulated only one member to experiment in this direction, some good would have been done. He reminded his hearers that in connection with their industry there was much research work yet to be carried out, which would have to be done by somebody.

The resolution was carried with much enthusiasm.

Mr. Evans, responding, expressed regret that time had not allowed of his preparing a more lucid paper on the subject chosen. It had to be got ready at very short notice; but he hoped those present had been able to follow him in his remarks.

Mr. A. L. Holton (Manchester) then moved a vote of thanks to Mr. Glover for presiding, and referred to the help that gentleman and the Association of which he was now President had rendered the juniors—adding that in his (Mr. Holton's) opinion there was a brighter day dawning for those engaged in the gas industry.

Mr. Franklin Thorp (Manchester) seconded the motion; observing that Mr. Glover had certainly done a great deal for the gas industry, his system of vertical retorts having practically revolutionized the method of manufacture. With the improvements taking place in the manufacture of gas, it was now for the distributing engineers to do their share to improve the efficiency of the gas so produced. It was recognized that, in the matter of radiant efficiency, they had yet a long way to go; and it was to be hoped that before long something would be done to increase the 60 candles per cubic foot which they had attained.

The Chairman, responding to the compliment paid him, said he was glad to be among the juniors that afternoon. He had not forgotten the days when he was a junior himself. One of the previous speakers was quite right in stating that they were living in very good days for getting information; but they must remember that added advantages brought with them added claims. Without in any way desiring to unnecessarily alarm them, he told the juniors that in the future much more would be expected of them in the positions they would be called upon to fill. Therefore it was for them to so improve themselves that they would be the better able to carry out the duties of a higher sphere.

Mr. Alsop then gave particulars of the syllabus for the present session, as follows: Nov. 2—Visit to the Stockport Gas-Works, followed by a discussion on "Some Principles of Wet Purification of Coal Gas," opened by Mr. C. E. Woodhead (Manchester). Dec. 3—University Lecture by Mr. Franklin Thorp, on the "Mixing of Gas and Air for Lighting and Heating." On the evening of the same day, there will be an informal discussion on "Incandescent Lighting." Jan. 11, 1913—Visit to the Birchenwood coke-ovens, benzol plant, Mond plant, &c., on the invitation of the President (Mr. D. V. Hollingworth). This is intended to be an official joint visit with members of the Senior Association. Feb. 1—University Lecture by Mr. W. R. Herring, whose subject will be "General Observations upon the Construction of Gas-Works and their Equipment." This will be followed, after tea, by a paper entitled "Some Notes on Charging Machines," by Mr. W. L. Heald. March 1—University Lecture by Principal J. W. Graham (Dalton Hall College) on "Hygienic Aspects of Gas." Subsequently Mr. F. H. G. Goodwin, B.Sc. (London), will read a paper on the "Design of Gas-Works Plant." March 29—Visit to the St. Helens Gas-Works. Paper by Mr. R. B. Glover on "Some Experiences in the Construction and Working of Vertical Retorts." April 12—Annual meeting, and visit to be yet arranged. May 3—United meeting of English Junior Gas Associations. Mr. Alsop remarked that this being the Yorkshire Association's invitation, the place of assembly would no doubt be somewhere within the borders of that county.

Town Planning from an Engineering Aspect.—This was the subject of a paper read before the Society of Engineers, on Monday last week, by Mr. E. R. Matthews, Assoc.M.Inst.C.E., the Borough Engineer of Bridlington. The author divided his subject under two main headings: (1) Town planning in a residential district; and (2) town planning in a manufacturing area. He illustrated the former by a brief description of Bridlington's town planning scheme, and stated that one of the principal points to be considered in the preparation of a scheme was the direction, width, and method of construction of main arterial, secondary, and subsidiary streets. He suggested that they should be constructed of tar macadam with grass margins, asphalte footways, and trees; and he gave a description of the method of construction he would recommend for the foundation of the streets and for the tar macadam roadway. The points which must be considered in town planning in a residential area included the supply of gas, electricity, and water, and in a manufacturing area the provision of electrical energy for lighting and power purposes.

MIDLAND JUNIOR GAS ASSOCIATION.

Opening Meeting.

The First General Meeting of the Eighth Session of the Association was held at the City of Birmingham Technical School on Saturday afternoon—the chair being occupied at the opening of the proceedings by Mr. R. J. Rogers, of Birmingham, retiring President. It was stated that letters regretting inability to be present at the meeting had been received from Mr. W. S. Morland and Mr. H. E. Copp, the President and Secretary respectively of the Midland Association of Gas Managers.

Mr. Wastell's New Appointment.

Mr. Rogers said that, before asking Mr. Shewring, the new President, to take the chair, he had to announce that since the last meeting the Council had elected Mr. Wilfrid Wastell, the late Deputy-Secretary to the Birmingham Corporation Gas Department, an honorary member of the Association. As they knew, Mr. Wastell had recently been appointed Secretary of the South Suburban Gas Company. He had always taken very keen interest in the work of the Association. He was one of the first members of the Council; and they were very pleased to be able to pay him this small compliment, and to feel that by so doing they would not altogether lose touch with him. The Hon. Secretary had received a letter from Mr. Wastell, in the course of which he expressed his gratification at being made an honorary member of the Association. Mr. Wastell added: "Although I have not been able to engage as actively as I should have wished in the work of the Association, I am pleased that you have enabled me to retain my connection with you, and so to keep up the interest in the Association which, as one of the first members, I have always had in it. I shall watch eagerly for your visits to London, as I look forward to joining you on future occasions when opportunity offers." Since the last meeting, also, Mr. G. F. Twigg, of Derby, had been elected to fill a vacancy on the Council.

The Commercial Side.

Mr. Rogers, continuing, remarked that he would like to take the opportunity of thanking the Council and the members generally for the support they had accorded him during his year of office. As one engaged on the commercial side of the gas industry, he had felt it to be a great pleasure to preside over the Association in the year just past, because he thought this period would be memorable in the annals of the industry, for the reason of the progress made in the organization of the commercial section, which had culminated in the formation of the British Commercial Gas Association. The first meeting of this new body, which had just been held in Manchester, had been a brilliant success; and the spirit of enthusiasm which was displayed on every hand there, he felt certain augured well for the industry.

The New President.

Mr. Rogers added that it required very few words of his to introduce the new President, Mr Shewring, who had always taken great interest in the Association, and had at considerable inconvenience come over to attend their meetings.

Past-President Thanked.

Mr. F. Shewring (Droitwich) then took the chair, amid applause, and proceeded to propose a hearty vote of thanks to Mr. Rogers—remarking that their late President had performed a large amount of hard spade-work for the Association during the past twelve months, and this had assisted greatly in keeping the organization on a sound footing. There was, he added, no question of "dry rot" in connection with the Midland Junior Association. It was unnecessary for him to say anything to the members on the subject of Mr. Rogers's ability.

Mr. W. H. Johns (Saltley), the Senior Vice-President, in seconding the vote, said that Mr. Rogers had filled the office of President in a manner that was a credit both to the Association and to himself. They knew when they put him in the chair that he was going to do good work; and he had done it. They had had one of their most successful years. He did not mean to belittle those who had gone before; but Mr. Rogers was a sort of new-comer in connection with the presidential chair, inasmuch as he was from the commercial side of the businss. This had made it all the more pleasant to be associated with him as Vice-President during his year of office.

The vote was heartily accorded, and

Mr. Rogers, in acknowledgment, said he had only done what he considered it was his duty to do. The fact of his vacating the presidential chair would not in any way reduce the amount of interest he took in the Association. He would always be happy and proud to do everything he could to forward the movement.

Presidential Address.

Mr. Shewring then proceeded to deliver the following

INAUGURAL ADDRESS.

First of all, allow me to thank you for the honour you have done me in electing me President of the Association—an honour which I greatly appreciate. My term of office has commenced one year earlier than I anticipated when appointed Junior Vice-President, due to Mr. Smart's unavoidable resignation. But pleased as we all were to hear of Mr. Smart's preferment, a feeling of regret passed over us at having missed from the literature of our Association what we felt certain would have been a valuable Presidential Address.

In my address, I will touch upon a few points dealing with gas-works economics, applied more particularly to small or medium-size undertakings. Small economies have always impressed me as being important to successful management, and, though they may seem insignificant in themselves, in the aggregate they are considerable.

Maintenance.

I remember reading somewhere that the truest economy is to be found in systematically maintaining all the works and plant in a perfect state of efficiency; and instances have come before my notice where the saving of a few pounds in maintenance has afterwards proved itself false economy.

A feature that requires carefully watching is the increased cost of maintenance that follows the adoption of additional plant. It sometimes happens, of necessity, that plant has to be duplicated without any material prospect of increased returns. A new gas-holder large enough for future expansion of business may replace one of a smaller size, new offices, store-rooms, or workshops may be erected for additional convenience, or exhauster machinery duplicated—the list could be continued indefinitely. The alterations, though necessary, do not substantially assist in increasing the profits; and frequently, in anticipation of old plant being discarded, little or no money has been spent on upkeep for some time.

The cost of the additions or alterations referred to may be paid for out of revenue, and not be subject to interest or capital repayment; but the expense of maintaining them in a proper state of efficiency is apt to make a serious inroad into the annual profit, and initiative must be displayed, as there appears to be no limit to the creeping-up of charges under this heading.

Steam Supply.

The delivery of dry steam to engines on works where the working pressure is low is not always possible; but there are many little things, the importance of which cannot be over-estimated, that are helpful in obtaining the best duty from the plant. Apart from the area of supply pipes, the absence of sharp angles, and the use of expansion joints at necessary points, the introduction of properly adjusted steam-traps for effective drainage over the system goes a long way to ensure supplies of dry steam. Experience has taught me that steam-traps require regular examination and adjustment to keep them working efficiently; otherwise they are steam-traps in name only. Some inexpensive traps depending for their action of water separation upon the expansion or contraction of metal or liquid, I have found reliable for indoor use; but when fixed in exposed places, the working is anything but good. Some syphon-type traps work with a wider range of temperature; but it is always best, when planning a drainage system for steam-pipes to arrange for the traps to be placed where the atmospheric conditions do not reach extreme temperatures.

The covering of exposed parts of steam-boilers, and lagging steam-pipes with non-conducting materials, are cheap and simple ways of conserving heat. Having regard to the saving resulting therefrom, this plan cannot be extended too far. I remember a case that struck me at the time as being evidence of the utility of non-conducting material. I had some steam-pipes that passed through a workshop lagged with a suitable preparation. Previous to this, the steam-pipes heated the shop to a comfortable degree of warmth in the coldest weather; but it was not long after the covering had been completed that complaints reached me about the room being too cold to work in, and the marked difference in temperature was observed by the writer.

Rain-Water Storage.

An economy in water consumption can sometimes be effected by taking advantage of Nature's endowment of rainfall; and when reconstructing our engine-house, an overhead water-storage tank was erected thereon, and arrangements made for rain water falling upon the retort-house and adjoining buildings to run therein. Circumstances may not justify this arrangement in all cases; but as well water is not available, and town water costs 1s. 6d. per 1000 gallons, it is apparent that the small original outlay was soon recovered.

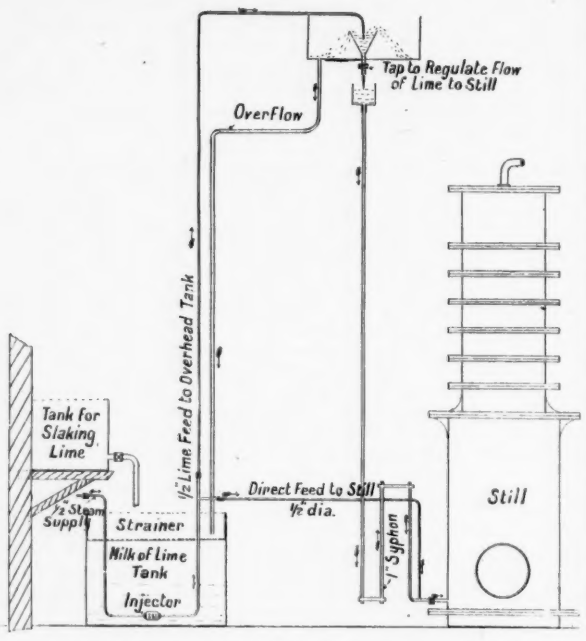
Ammonium Sulphate Plant Working.

There is such a marked variation of ammonium sulphate recovered per ton of coal carbonized at different gas and coke-oven works that, after making due comparative allowances, it is difficult to explain why such difference exists. In some cases, it may prove advantageous to thoroughly investigate the working and construction of the plant employed, with the object of arriving at its actual capacity and efficiency. It does not, however, necessarily follow that returns will be improved in all instances, as there are other things that may account for the apparent loss of ammonia. After repeated trials with the plant at Droitwich, I was unable to obtain good results without some modification of plant. On small works, where stokers invariably attend to the working of the sulphate plant in between their other duties—at all events, during the night shift—the highest returns are not to be expected; for with the best plant intelligent and constant attention is necessary to reduce the ammonia content in the spent liquor to figures approaching the neighbourhood of 0·006 per cent. In endeavouring

to improve the results, I satisfied myself that, with the labour devoted to working the plant, the hand-pump arrangement employed for injecting lime into the still was practically useless. There was no assurance of its being regularly used, and the effect of spasmodically pumping an excessive quantity of cold milk of lime into the still does not tend to even working. The periodical displacement of a large quantity of liquor which contains the fixed ammonia, and the reduced temperature in the still which follows, are features to be avoided for successful working.

After experimenting with several methods which proved unsuccessful, I adopted an injector lime-feed, which elevates the milk of lime into an overhead tank, with a tundish or similar receptacle fitted therein. The milk of lime is injected direct into the tundish, and its flow regulated by a cock into a sealed pipe connected to the bottom of the still; the surplus returning to the lime-tank by an overflow pipe fixed at the bottom of the overhead tank. The object of having the inner receptacle arrangement is to prevent the lime settling in the bottom of the tank, and clear water only passing into the still. The injector can be worked intermittently, or arranged to give a fairly constant feed of milk of lime to the still, in such quantities as desired; and an improvement in results amounting to 2 lbs. of sulphate of ammonia per ton of coal carbonized followed its adoption.

I also connected a supply-pipe direct to the still; and this can be used if stoppages occur in the overhead tank or syphon-pipe, or when it is disconnected for cleaning purposes. The sketch explains the arrangement at a glance.



Liming Arrangement in Use at the Droitwich Gas-Works.

Another point that surprised me was the free ammonia present in samples taken from the bottom tray of the still, amounting to over 100 grains per gallon. The plant was seldom worked above its stated capacity; and the strength of liquor and method of working were varied with the object of getting the best possible results. I felt convinced that the trouble resolved itself into "time-contact" of the liquor passing through the still; the efficiency of a still being in proportion to the time of contact, and the capacity or size of the structure to bring about that time. In other words, to secure the slowest speed of the liquor consistent with its effectual treatment. This could have been accomplished by adding extra trays to the still; but as this would have necessitated structural alteration of the building, a more simple and less costly way was sought for.

It occurred to me that, by increasing the seal of the trays, the extra agitation of liquor resulting therefrom might bring about a reduction in free ammonia. This proved to be the case; and the following are average tests of samples taken from the four bottom trays of the still.

—	Free Ammonia. Grains per Gallon.	Fixed Ammonia. Grains per Gallon.	Total Ammonia. Grains per Gallon.	—
Tray 4 . . .	155	359	514	Strength of liquor used, 10 ozs.
,, 3 . . .	119	406	526	
,, 2 . . .	119	442	561	
,, 1 . . .	51	439	490	

The jacketing of the heater with non-conducting material, to retain heat, is an expense that shortly repays itself; and I should also jacket both stills, but for the fact that they have to be taken entirely to pieces for cleaning-out purposes. In large plants, where manhole plates are provided for readily cleaning out, the stills may be jacketed with advantage.

PURIFICATION.

The arrangement of purifiers on many small and medium-sized works does not allow the rotation system of purifying being practised in its most effective form, though it can generally be carried out in a lesser degree. Some time ago, the thought struck me that, by reducing the layers of oxide and increasing the thickness, better results would be obtained. On looking up the records taken at the time, I find that there was no more gas purified per cubic foot of oxide when working with two layers of oxide 2 feet and 14 inches deep than with three layers each of 8 inches thickness. The boxes charged with two layers did not require changing so often, and a saving of labour was effected; but the increased run of the box was entirely due to the larger bulk of oxide contained in it.

A very marked improvement, equivalent to 40 per cent. reduction in boxes emptied, followed the use of a steam-compressor for injecting air into the purifier. The air is injected into the inlet main of the purifiers, and the temperature of the gas increased—promoting activity in the boxes, with beneficial results.

In passing, I may mention that a large amount of moisture is carried forward in the gas, and condenses *en route* in the mains or purifiers. Provision must be made for arresting this condensation, to prevent water-logging of the mains. In my case, I fixed a syphon on the inlet purifier main as near the boxes as possible. The system of air injection in use, which is capable of fine adjustment, is almost identical with the apparatus described by Mr. R. G. Shadbolt, then of Low Moor, in a paper read before the Manchester Institution in 1895.

The inactivity of oxide, due to its becoming acid, is at times troublesome; and the necessity for frequent changing of boxes, involving extra labour, adds to the cost of purification. I think the most simple and inexpensive way of producing alkalinity of the material is to give it a dressing of quicklime; and I have not heard that this in any way depreciates the value of the oxide when spent.

PRIMARY AIR FURNACE CONTROL.

A few years ago, I had the pleasure of inspecting the Municipality of Brussels Gas-Works; and Mr. W. Bromham, who was then Superintendent-in-Charge, was good enough to show me his invention for controlling the supply of primary air to regenerator settings. Anyone who has had experience of furnace-gas testing, is well aware of the loss of carbonic oxide which immediately follows clinkering and shaking or poking of furnace-bars, also the excess of oxygen which is invariably found in the flue gases prior to bar cleaning. The cause of this is obvious; and the object of Mr. Bromham's patent is to equalize these extreme conditions as far as possible. Judging by comparative charts showing the result of tests of waste gases taken every two hours, as it leaves the setting from beds working with and without his arrangement, he has every reason to be satisfied with the result.

The following is a brief description of the regulator. A strong clock fixed in the subway operates a slight cord, which passes in front of the furnaces. This cord travels over small pulley-wheels to reduce friction, and the cord is connected to a cam which actuates a vertical rod connected to the shutter of the primary-air inlet. It is regulated to open and close the primary air inlet between the periods of clinkering. When the furnace is being clinkered, the air-shutter is down; and as the cord rotates, the cam slowly opens the shutter, so that by the time the fire is ready for clinkering the air-inlet is at its maximum. The regulator is easily set to enable clinkering to be carried out at any fixed time. I am not aware of its introduction into English gas-works; but I understand that it has been adopted at several works on the Continent.

GAS SERVICE-PIPES.

The experience of people who use wrought-iron pipes varies so considerably in different localities, that it is difficult to give the approximate life of same, though in some parts of Droitwich services have had to be renewed that have not been in use more than twelve months.

In a valuable paper, entitled "Notes on the Corrosion of Service-Pipes," which Mr. James M'Leod, of Greenock, read before the Institution of Gas Engineers last year, the author dwelt upon the radical changes of late years in the employment of higher heats in carbonization, and the sole use of oxide of iron in purification, with revivification *in situ*, &c., as having a decided effect upon interior corrosion of service-pipes. The author stated that he is afraid there can be no prevention, and that it is one of the penalties to be paid for improved methods of working.

We are to-day, more than ever, in the unhappy position of having to face the two evils of interior and exterior corrosion. It is more particularly with the prevention of the latter that I offer my comments. The iron piping commonly used for services may be divided into four classes, as under:—

1.—Ordinary black iron quality.
2.—Best heavy steam quality.
3.—Best heavy galvanized quality.
4.—Heavy quality, coated with a bituminous solution, wrapped with jute cloth and again coated.

The first should be condemned straightway. The saving in cost compared with heavier steam quality is so slight that it is not

worth consideration, and the risk of defective fittings and broken joints, where services are unavoidably laid with a shallow covering of soil, and their decreased durability, are the more important factors to be borne in mind, as these seriously run up the leakage of gas, and cost of maintenance.

The second is the class of piping in general use, on account of its extra strength; and for some years I was inclined to think it satisfactory. Some time ago, I had occasion to take out a lamp service, a portion of which had been laid about two years previously with heavy quality steam piping. On examination, it was found to be considerably oxidized, and galvanized iron piping which must have been in use for at least seven or eight years was perfectly sound. I therefore decided to examine services that had been laid from one to three years, with the result that oxidization was visibly taking place in the majority of them.

With regard to No. 3, the benefit obtained from the galvanized coating in prolonging the life of the pipe is, unfortunately, more than counterbalanced by a deposit that forms in the interior of the piping, restricting its area, and in some cases almost completely blocking up the gas-passage. In these days, when services are periodically taxed to their utmost capacity by the increased use of heating and cooking appliances, and with the probability that future years may see further advances, any feature tending to reduce the flow of gas should be carefully avoided. The difficulty may be minimized by laying services of larger size to allow for any making up, though the practice does not commend itself to me.

I prefer to use exclusively heavy quality steam-pipe wrapped and coated as before described. Wrapped pipes are preferable to the more troublesome and expensive way of laying pipes in wooden V-shaped troughs, and afterwards filling with a tar preparation. There are, however, in their application, a few points that should receive careful attention. To obtain a sound grip of the pipe for screwing-up purposes necessitates the disturbance of the wrapping, and care should be taken to have this tarred and re-covered with canvas before the ground is filled up. The same treatment applies to the bend, connector, or any exposed iron, as it is patent that, if all parts of the service are not treated similarly, the object of the wrapping is defeated. The unevenness of the outer surface makes it more difficult to observe the level of the pipe in places where fine adjustment is wanted, and extra care or supervision is called for in this direction.

A point not to be lost sight of is the opportunity afforded to makers of supplying an inferior class of tubes. They may be light, weak, or badly welded, and, with the covering on, perfectly gas-tight; but the thought of these conditions prevailing is not altogether comforting. I do not wish to suggest that makers of reputation would purposely do this; but it allows an opportunity for hiding bad workmanship. The occasional weighing and examination of pipes appears to the writer as being, if not absolutely necessary, at least desirable.

INCOME-TAX AND RATING.

Speaking now as a member of the Senior Association, I may be pardoned for calling attention to a couple of branches of the gas profession that juniors do not appear to study sufficiently. In their eagerness to obtain proficiency in the constructional, mechanical, and other more fascinating branches of the business, some of the less interesting, but very important, side-lines are apt to get neglected. The side-lines to which I more particularly refer are income-tax assessment, the rating of gas-works, and the practical use of that important bye-product, sulphate of ammonia.

The intimation given a year or two ago that the annual allowance for depreciation of plant on gas-works would be discontinued, brought authorities face to face with income-tax assessment. Many works had for years past obtained an agreed percentage for depreciation, and this had worked harmoniously. After this had been discontinued, there was no alternative but to see that full credit was obtained for all discarded plant, or plant that was being replaced out of capital expenditure. There are cases where allowance is justifiable in connection with prepayment installations, hired cookers, and services, in addition to the larger plant in use on the works. Personally, I have never had occasion to regret spending the time in reading up these somewhat dry subjects.

PRACTICAL USE OF SULPHATE OF AMMONIA.

The annual production of sulphate of ammonia in Great Britain has for many years been increasing; and in the evolution of time it is not unreasonable to suppose that new discoveries will be made to recover more of the nitrogen in the process of coal carbonization. An improvement has already commenced with the adoption of vertical retorts; and I think that the time will come when medium and small gas-works will not be satisfied with results lower than the larger concerns. This will mean an extra quantity of sulphate of ammonia for disposal. The provision of a market for the same should concern us all; and though much good work is being done by the Sulphate of Ammonia Committee, the matter should also receive the individual assistance of every gas engineer in the country.

Out of an annual production of over 384,976 tons of sulphate of ammonia, only 93,093 tons are used in Great Britain, the balance being shipped abroad. As with most other commodities, supply and demand govern prices; and to enhance the value of sulphate of ammonia, home consumption must of necessity be encouraged. The work therefore seems to lie around our own doors in promoting the local use of a valuable and profitable manure. For the last two years, our annual output of sulphate of ammonia has been sold locally; and this state of affairs has been accomplished by advertising and circularizing farmers with instructive literature, and also by personally introducing its merits, with some little suggestions as to its application.

I commend the idea of studying the subjects mentioned under the last two headings to members of Junior Associations who have up to the present omitted to do so, knowing that, though it cannot bring pecuniary profit to all, its reward will come in other ways, and this reward will ultimately be reaped by the gas profession as a body.

A Word of Welcome.

The President remarked that, before he resumed his seat, he would like to say how pleased they were to have the honour of Mr. A. Cooke's company at the meeting. It might not be known to all of them that for some little time Mr. Cooke's health had been somewhat indifferent. When he (the President) wrote asking him if he could be present at the meeting, he replied that he would do anything he possibly could to assist the Midland Junior Association. Knowing the amount of work Mr. Cooke had put in during his year of office as President of the Senior Association, he was specially pleased to see him with them that day.

Vote of Thanks to the President.

Mr. F. J. Ward (Knowle), the Junior Vice-President, in proposing a hearty vote of thanks to Mr. Shewring, said that he had covered a rather large field in his address, as he had expected he would do, being in the position he was at Droitwich, because his duties there entailed the superintendence of a big variety of subjects. It would not become them to criticize the address, as it was an understood thing that the President's statements should be accepted as being actual facts. There were, however, one or two points he would have liked to say something upon, had it not been for this rule. He was sure they all felt that they had had a first-class address.

Scope of the Juniors.

Mr. Johns, who seconded, agreed with Mr. Ward that it would be hardly fair for them to criticize the President's address, but added that there was just one point which he wished to say something about. He would not like it to go forth from the meeting that there had been any neglect on the part of the Midland Juniors to do work which they ought to have done. He referred to the question of studying the important matter of works assessment, and dealing with maintenance, depreciation, and other things connected with the financial side of the undertaking. He had always understood that a Junior Association should be exempt, as far as dealing with financial results was concerned. Such work should fall to the lot of the manager. Unfortunately, not many of the members were managers; and some of those who were, were not in charge of the financial part of the undertaking. Therefore it had always been an understood thing that they should leave these matters severely alone in discussion. At the same time, he admitted that they would be very foolish if they did not study them privately, and so fit themselves for the day when they would be called upon to take full control of a gas undertaking. They were indebted to Mr. Shewring for the great amount of information he had given them—which he could go on discussing for some time, if he were at liberty to do so.

The Question of Service-Pipes.

Mr. A. Cooke (Oldbury) said he would much like to thank Mr. Shewring for inviting him to the meeting. He would have been only too happy to have put in a few more attendances during the past year; but ill-health and a very great deal of work at Oldbury had prevented this. As to the address, he could only endorse what had already been said. It bristled with information for all the juniors to tackle with both hands. With reference to service-pipes, he thought Mr. Shewring was on the right tack in using steam-pipe, and steam-pipe alone. For the last twenty years at Oldbury, he (the speaker) had used nothing but steam-pipes and the very best main-cocks; and he was satisfied that the bulk of gas leakage came from badly laid pipes of inferior quality and bad cocks. His own experience was that, with a make of 12,440 cubic feet per ton of coal, the leakage was under 5 per cent.; and this, he felt sure, was in a very great measure to be accounted for by the overhauling of service-pipes periodically, and by not having anything but the best material that could be purchased. In conclusion, he would like to say that if at any time members cared to visit Oldbury, and see what was being done and what had been done there, he would be very pleased to welcome them.

Mr. R. S. Ramsden (Burton-upon-Trent) congratulated the President upon having worked into his address so many useful points. They could compare his methods with their own, and see whether it was possible, by adopting his suggestions, to effect an improvement. It was evident that Mr. Shewring went thoroughly into things at his own works. He trusted the extensions now in hand at Droitwich were going on satisfactorily, and that they would not take up so much of the President's time as to prevent him giving a good share of it to the Association.

The vote was heartily accorded; and the President duly acknowledged it.

The Membership and the Transactions.

The Hon. Secretary (Mr. W. J. Pickering) announced that four new members had just been received into the Association, making the ordinary membership 194—which they would agree was quite

a respectable total. The matter of combined "Transactions" and single "Transactions" had been carefully gone into by the Council, and also by the Joint Council at their meeting in Sheffield last May; and the result was to show that if only the combined "Transactions" were prepared, the cost of them would be too great. Therefore the printing of the single "Transactions" would be continued. It should, however, be borne in mind that the cost of the combined "Transactions" would be slightly less if more members purchased them. Several promotions and removals had taken place which he would like to put on record. Mr. Wastell's departure from Birmingham had already been referred to. Mr. A. O. Jones, a Past-President, had gone to Manila; while Mr. W. Ault had gone from Saltley to Messrs. W. J. Jenkins and Co., under their old friend Mr. Smart. Mr. C. M'Pherson had left Nechells to become Manager at Clay Cross, and had resigned membership of the Association; while Mr. H. E. Stone, late of the chemical staff at the Central Laboratory, had succeeded Mr. M'Pherson as Works Foreman at Nechells. Mr. H. Punnett had gone from Richmond (Surrey) to be Assistant Engineer at Edmonton (Alberta). Mr. W. L. Westbrook, of London, who read a paper last year, had been transferred to the London Association. Mr. C. Harris had removed from Great Wigston, near Leicester, to Maryport, and Mr. J. T. Turpie had gone from Rugby to be Manager to the Grange and Cartmel Gas and Water Company. He did not know whether this was a complete list.

THE SESSION'S PROGRAMME.

The next fixture of the Association is for Nov. 14, when Professor F. W. Burstall, M.A., of the Birmingham University, will deliver a lecture on "High-Pressure Gas." Professor Burstall will probably deliver two further lectures early in 1913; but the dates of these have not yet been determined upon. On Dec. 7 there will be a concert; and on Jan. 11 Mr. P. C. Balcon, of Birmingham, will read a paper on the "Value of Complete Gas Analysis in Gas Manufacture." An address by Mr. J. Ferguson Bell, on Feb. 8, will be followed by a dinner and musical evening. There will be a visit to the Wolverhampton Gas-Works on Feb. 22; and on March 8 Mr. N. B. Hodgkin (Birmingham) will read a paper entitled "Distribution." The President has invited the members to visit the Droitwich Gas-Works, and inspect the alterations and extensions there, on April 12; and then during May there will be a joint meeting of Junior Gas Associations in Yorkshire.

HIGH-PRESSURE GAS AT ST. LOUIS.

In a recent issue of "Engineering News," Mr. Frank Richards, of New York, furnished the following particulars of the installation of high-pressure gas at St. Louis (Mo.) by the St. Louis County Gas Company.

The installation at St. Louis is an example of the practical established transmission of artificial gas at high pressure, and its direct delivery to the consumers without the intervention of any district gasholder. There are gasholders of the familiar type at the gas-generating plant, where the pressure maintained is from 5 to 9 inches of water—the latter being the maximum pressure reached when the tank is full, and no other gasholders are required for the distribution system. The compressors take the gas at this pressure, and compress it to a maximum of 40 lbs. gauge. The pipes into which the compressed gas is delivered have a capacity of 20,000 cubic feet, and these constitute the entire storage for the gas after leaving the compressor. As a pressure of 10 lbs. is sufficient for all purposes, the permissible range of pressures in this pipe system—about two atmospheres—allows fluctuations of about 40,000 cubic feet of low-pressure gas in the quantity of gas contained, though neither limit of pressure is actually reached in practice. The gas comes to the consumer at whatever may be the pressure in the pipes at the time, and then it passes through an individual pressure reducer, after which it is metered at the constant low pressure maintained.

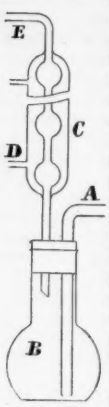
In one corner of the compressor-room is apparently a vertical receiver, the familiar accompaniment of the air compressor; but in this case it is, instead, a tar-extractor through which the gas passes before entering the compressors. These machines are two duplex compressors, with cross-compound steam cylinders, 12 and 23 inches in diameter, and duplex tandem gas-cylinders, 17¼ inches diameter, with a common stroke of 18 inches and a normal speed of 120 revolutions per minute. The gas-cylinders are, of course, completely water-jacketed. The mean horse power is said to be about 120, and the gas-compressing capacity, with liberal allowances, some 1½ million cubic feet per 24 hours. This approximates the present producing capacity, but considerably exceeds the consumption.

The gas is delivered into an 8-inch main, from which there are branches or continuations of 6-inch, 4-inch, 2-inch, and 1½-inch pipes, the aggregate length of which may be inferred from the fact that the area served is about 120 square miles. The present number of consumers is 6000, which number is being increased as fast as the pipes can be laid; the present daily gas output being approximately 500,000 cubic feet. Only one of the two compressors is as yet required, and this is run for 16 hours a day.

This is not to be considered as in any respect an experiment, at least with this Company, as they have for some years been following the same system of distribution, and find that it not only gives satisfaction to all, but that it pays well. They have never experienced trouble from deposits in the pipes; and the gas is found to be practically as rich after compression and transmission as before. Nor has any trouble or danger been found from the heating of the gas in the compressing operation; and there has been no accident of any kind.

TESTING FOR NAPHTHALENE IN CRUDE GAS.

The current number of the "Journal des Usines à Gaz" contains a description of a method of ascertaining the quantity of naphthalene in unpurified gas, devised by M. Ab-der-Halden, the Engineer-Chemist of the Continental Union Gas Company. Having occasion, during some special tests, to determine the total amount of naphthalene contained in the gas between the hydraulic mains and the washers, he conceived a method capable of treating the crude production before it had been freed from tar. If there is introduced into unpurified gas containing naphthalene an excess of vapour of alcohol at boiling-point, and the mixture thus constituted is afterwards cooled, the vapour in condensing carries with it the whole of the naphthalene. When the desired quantity of gas has been treated, the naphthalene is separated from its alcoholic solution by a current of steam, filtered, and weighed. The process was carried out by means of the apparatus shown in the accompanying diagram. The crude gas enters by the glass tube A, and passes into the receiver B, which has a capacity of about 100 c.c., and contains 50 c.c. of absolute alcohol, kept at boiling-point by a water-bath. The gas is saturated with alcohol vapour, and rises into the refrigerator C, which contains five bulbs, fed at D by a current of water as cold as possible. The naphthalene, condensed with the alcohol, falls back into the receiver; and the gas, leaving the apparatus at E in a purified condition, is measured. The whole of the tar remains in the receiver. The test is generally made on a quantity of gas varying between 40 and 100 litres (1·4 and 3·5 cubic feet)—the former at the outlet of the hydraulic mains and the latter after the Pelouze and Audouin condenser; and its duration ranges between half and three-quarters of an hour. This period is sufficiently short to allow the naphthalene in the gas to remain constant at a given point. At the close of the test, the contents of the receiver are transferred to one having a capacity of 2 litres (3½ pints), and containing 1·5 litres (2·6 pints) of water. The small receiver is rinsed with 50 c.c. of alcohol at 95° C., which is kept at boiling-point for five minutes, without causing any gas to pass. The naphthalene passes at the outset with the alcohol, and, by dilution in water, precipitates in a pure state. The following figures will give an idea of some of the results obtained by the method described. The points at which the sample of gas was taken off were: A, outlet of the hydraulic mains; B, outlet of the collector; C, inlet of the Pelouze and Audouin condenser.



	A.	B.	C.
Temperature of the gas . . .	59° C.	51·5° C.	45° C.
Weight of naphthalene . . .	0·5386 grm.	0·666 grm.	0·209 grm.
Gas passed	45 litres	60 litres	100 litres
Naphthalene per cubic metre	11·97 grms.	11·10 grms.	2·09 grms.

The Vertical Gas-Retort Syndicate report that the Dessau Company have received an order for ten beds of eighteen 5-metre retorts, or 180 retorts in all, for the Geneva Gas-Works.

In the "JOURNAL" for the 3rd ult., we reproduced from "Good Lighting" an article by Mr. R. F. Pierce, entitled "Another Aid in Illumination Calculations." We learn that the publication named is not, as was inadvertently stated, the organ of the Illuminating Engineering Society of New York, but is issued by the Illuminating Engineering Publishing Company of that city.

The members of the Yorkshire and Northern Districts of the Institution of Municipal Engineers will hold a joint meeting at Harrogate next Saturday, and permission has been given by the Corporation for visiting various municipal works. At the depôt, they will see in operation the new tar macadam mechanical mixing plant; and at the Iron Gate and Harlow Hill reservoirs they will inspect the sand-bed and Candy-Whitaker mechanical filters.

M. Burgevin has taken out a patent for France for a process for obtaining ammonia from cyanides derived from gas-purifiers. According to an abstract of the specification in the current number of the "Journal of the Society of Chemical Industry," the cyanide compounds are intimately mixed with slaked lime or with quicklime, according as the products are solid or liquid, and are distilled in retorts at a red heat, with the liberation of 95 per cent. of their contained nitrogen in the form of ammonia.

Cleaning water-mains with mechanical scrapers at Halifax (Nova Scotia) has effected a considerable increase in the hydrostatic pressure at hydrants. In a paper read before a recent meeting of the Union of Canadian Municipalities, Mr. F. W. Doane, the City Engineer, stated that in one case the average pressure upon 25 hydrants increased from 34·2 to 54·4 lbs. per square inch as a result of cleaning. In another district there was a pressure of 19 lbs. after cleaning, where before there was no water at all.

THE STATUS OF THE MUNICIPAL ENGINEER.

At the Annual Meeting of the Institution of Municipal Engineers, held in London at the close of last week, the PRESIDENT (Mr. Frank Latham, M.Inst.C.E.I.), in the course of his Inaugural Address, offered the following observations on the subject of the elevation of the general status of the municipal engineer.

The municipal engineer of to-day is the expert of less than a quarter-of-a-century ago. Works which would then have necessitated the knowledge and experience of the specialist are now undertaken by the municipal engineer as a duty. Municipal authorities expect the best and most up-to-date advice from their engineering officers on all subjects, whether it be sewerage, water supply, sea defence, public buildings, or building and sanitary law. The experience required by the municipal engineer is extremely wide, and he has an every-day routine in which that knowledge has to be speedily directed from one subject to another by an active level-headed mind. Nothing short of an early training and continual personal application and study throughout one's whole career will make the man ready to cope with all exigencies. There are few, if any, professions which require the same amount of personal tact, skill, and determined research as that of the municipal engineer. He can never afford to be idle, or he will be behind the times of modern inventions and modern practice.

If the utility and antiquity of any service are proofs of its status, the profession of the engineer must claim a very high position. Engineering is the basis and foundation of development of every description. Wherever a village or town springs up, an artificial existence results, calling for the attention of the municipal engineer in preserving the health of the community. From the remotest ages of the world, wherever civilization advanced to any degree of refinement, works of water supply and sewerage and measures for ensuring cleanliness were universally adopted. The road to advanced civilization commenced with the inventions of the engineer; and progress, refinement, and health have gone hand-in-hand with the advance of engineering. Not only is this the case, but the engineer is directly responsible for the great scheme of intercourse and transport which prevails throughout all parts of the world—getting the remotest places within easy touch of the great centres.

The civil engineer of to-day does not profess to be an architect; but the municipal engineer cannot afford to neglect this very important and artistic side of his profession. A substantial knowledge of architecture is essential to his success, as buildings of various descriptions have to be designed and constructed under his supervision. He is called upon to advise his council on the laying-out of estates and the examination of building plans, while he has the planning of many schemes which must necessarily call for artistic treatment at his hands. A municipal engineer engaged at any seaside resort would be quite unsuited to hold his position without a knowledge of architecture, by which he could design and carry out the works expected of him. The interests of municipal engineers require watching in this respect, for their profession is so intimately associated with architecture and civil engineering that no legal rights of status or protection should be granted to either one profession or the other without the rights of the municipal engineer being recognized on both sides.

To be a competent engineer to a municipality, a man must be cultivated in every direction—civil and mechanical engineering and architecture. He must be acquainted with the classical side of engineering. Water and sanitary engineering call for a keen interest in geology; sea coast engineering demands a study of the phenomena of the sea. In fact, most subjects, if studied deeply, have a very interesting classical side. But, apart from all the refinements of the mind, the official must be a business man and a gentleman of tact and thoughtful consideration.

The fascination attached to the scientific side of engineering may influence the student to the detriment of his practical training. This may be more particularly said of those whose scope for the practical is limited. But the practical cannot be limited to the student who couples the theoretical with personal research and experiment. Practical utility must follow; and its development is the most valuable and interesting of engineering pursuits. It behoves the enterprising man to begin early to be constantly on the alert in observation and the acquisition of the common-sense side of engineering. He should undertake personal observations and experiments, and allow the practical and scientific to run in harness together.

The engineer whose enthusiasm is awakened to the enormous scope of interest to which his profession lends itself, is well able to look after himself so far as knowledge-seeking is concerned; and, to my mind, it little matters to which engineering society he devotes his attention, since he is sure, sooner or later, to become a useful member of society. Institutions have undoubtedly raised the status of the profession as a body within the last quarter-of-a-century. The reading and discussion of papers on advanced subjects has had good effect. Members who attend meetings or study the papers read are bound to obtain some advantage. By taking part in visits to works, the member is enabled to learn in a short time many important matters which it has taken years to invent and perfect. He sees the undertaking in actual progress; and his practical observations must be very helpful.

For all I have said with regard to the important position which the engineer occupies, together with the immense amount of cultivation he has to undergo in becoming fit and suitable to improve the conditions under which a crowded nation lives in these progressive days, it is much to be deplored that there is a tendency, and an ever-growing tendency, in every direction to underestimate the value of the engineer's labours. While this very unsatisfactory condition exists, the profession is being undermined, and its progress belittled; and its followers are losing the respect and worth which are so essential to encourage those high ideals which lead to the best results.

It cannot be expected that a man struggling for a bare existence can devote much of his scanty earnings to the interests of his professional instincts and inclinations. He lives in a sphere of uncertainty in neither being protected by the State nor assured as to his prospects in life, while, on the other hand, his energies are not backed up by superannuation. The municipal engineer has to live among the work for which he is responsible. The slightest pinhole for agitation will be taken advantage of by an ever-clamouring section of the public. The whole business is surrounded with difficulties and worries which would be ameliorated, if not entirely overcome, by statutory measures to afford protection and security of tenure.

An official who is honestly conducting the affairs entrusted to his care is deserving of every respect and consideration—in fact, assuming he has been well educated, trained, and proved, he is a professional man of status. But if some councils will not appoint men who are qualified and approved by engineering societies, and bound by their rules, the profession must suffer. The tendency of public opinion is to go with the lowest and most discreditable example, whose interest is better served in being free than fettered by the rules of an accomplished society.

LAYING AN INTAKE IN DEEP WATER.

A recent number of "Engineering Record" contained an account of operations incidental to the laying of a water-works intake line in 65 feet of water at Marquette (Mich.). The following are some particulars extracted from the article.

In the extension of the water-works intake at Marquette (Mich.) to a point 3000 feet off shore in Lake Superior into water 65 feet deep, sections of six pipes each, jointed on the dock, were floated into position, sunk, and connected-up by a diver. Water for the city, which has a population of 12,000, is delivered through a submerged intake pipe to a well located just outside the pumping-station, 200 feet from the lake shore. Built in 1891, the station was equipped with two 3-million gallon pumps on direct service, and a battery of three 100 H.P. boilers. For the original supply, a 24-inch intake-pipe extended 800 feet from the pumping-station into 22 feet of water. As more or less trouble with this pipe was experienced from ice and leakage, it was practically abandoned after it was supplemented in 1901 by a 42-inch steel pipe, of about the same length laid parallel to it and 20 feet to the south. The larger pipe terminated in an upturned elbow fixed 16 feet below the surface.

For some years the water supply has not been considered satisfactory from a sanitary point of view. There have been frequent outbreaks of typhoid fever, and a disagreeable taste has been given to the water, attributed to the large amount of creosote discharged into the lake from an iron furnace about a mile from the intake. During north and north-west winds, the creosote is said to find its way into the supply. The main sewer outlet of the city discharges into the harbour inside the breakwater, and about 2000 feet from the end of the old intake. Several possible means of correcting these conditions were suggested; the two finding most favour being the removal of the intake and the pumping-station, and the extension of the existing intake line into such depth of water that the possibilities of serious contamination either from sewage or creosote would be practically eliminated. It was estimated that the cost of removing the existing works would exceed by $100,000 the amount allowed by law to be issued; so it was decided to extend the intake. Messrs. Herring and Fuller, of New York, who had been engaged to report upon the subject, recommended the extension of the intake 3000 feet off shore, where the water was 65 feet deep. A hypochlorite of lime sterilization plant, recommended as an emergency measure, was built towards the close of 1910, and put into operation that winter. The intake extension contract was let in June, 1911. Deliveries of material were begun in August, and the actual work was started in September.

According to the plans, the elbow at the end of the 42-inch pipe was to be replaced by a reducing T-piece and a 36-inch gate-valve, beyond which approximately 2300 feet of 36-inch cast-iron pipe were to be laid with an upturned intake at the end. The original plans also provided for a 30-inch gate-valve on the side outlet of the reducing T-piece and a crib at the outer end of the extension. After the contract was let, some modifications in the original design were made—a blank flange being substituted for the 30-inch valve and the crib omitted.

On removing the end section of the 42-inch pipe, it was found half filled with sand, and the joints in bad condition. Under an agreement entered into with the contractors, about 600 feet of the old pipe were taken up, cleaned, and relaid before proceeding with the extension. Owing to adverse weather conditions, the actual work of laying the extension did not get underway until the latter part of November. Work was continued till ice in the

harbour necessitated closing-down all operations a month later. During this time about half the pipe of the extension was laid.

The contractors' equipment comprised a tug 75 feet long by 18 feet beam; a 93 ft. by 34 ft. scow, on which was mounted a stiff-leg derrick having a 60-feet boom operated by a vertical hoisting-engine on the stern of the scow; a smaller scow equipped with a 7-inch centrifugal sand pump and engine for operating it; and a smaller scow from which the diver worked, with a house containing the diving apparatus. A stove on the diving scow kept the men at the air-pump comfortable, and in cold weather supplied warm air to the driver. A pipe-line from the engine on the derrick scow supplied steam to a small steam-winch which was used for handling anchor lines at the forward end of the scow. Anchor lines at the stern were operated by the hoisting-engine. Men on the derrick dealt with pipes on the dock, placed them in position for jointing, handled concrete, and subsequently operated the dredge bucket.

Pipe was delivered on cars at the upper end of the dock, unloaded by a small derrick erected at the side of the track, and rolled to the outer end of the dock, where the sections were made up. The line was laid in 72 feet sections of six lengths of 36 inch bell and spigot pipe, connected to adjacent sections by special bolted flexible joints. After placing the pipes in position on the dock, full lead joints were poured and thoroughly caulked in the usual manner. Only enough jute was used to keep the pipe lined up. A special ball-joint was employed for joining sections under water; one half of the joint being placed at either end of a section. In preparing the ball joints, a short piece of pipe, with a spigot turned to the same radius, and corresponding to the spigot of the ball-joint, was inserted in the bell almost to a point of maximum diameter, and then carefully aligned. A strand of jute was next inserted and caulked, and a lead joint poured and caulked. The spigot was then withdrawn, leaving a lead gasket about 3½ inches deep adhering to the bell. Just before lowering the pipe into position, this lead gasket was thoroughly painted with white lead, to secure a better joint by filling any irregularities.

For handling the pipe, two shear-legs, placed 40 feet apart at the side of the derrick scow, were equipped with double blocks, from which cables led across the scow to hand-operated crab winches placed on the opposite side. With these winches it was possible to raise or lower the pipe through very slight distances, and much more steadily than could be done by the derrick. The sections of pipe, suspended from the shear-legs over the side of the scow, were towed into position, and then lowered. While still in the slings, the diver guided the spigot into the bell and bolted it up. The outer end of the section was held clear of the bottom by wooden wedges, fixed by the diver as the pipe was lowered. Wooden bulkheads, placed over the ends of the section to exclude dirt, &c.. were removed by the diver and sent up for use again. To keep the scow exactly in position and to maintain it under perfect control at all times, six anchors, three at either end, were usually dropped. When the lake was at all rough, pipe-laying was impossible—a dead roll being much worse in this respect than a short, choppy sea.

For the purpose of keeping the pipe in position on the bed of the lake, obtaining a uniform bearing, and protecting it, the pipe was laid in saddles made with sacks of concrete, and further anchored with large boulders and riprap. As the bottom sloped quite uniformly, and was mostly rock where the extension was laid, very little dredging was attempted. In working weather, one section a day could easily be placed; while on several days two, and on one day three, sections were placed. The working force averaged about fifteen men, nine of whom, composing the regular crew, were employed continuously.

Cleaning and replacing the 600 feet of old 42-inch pipe were contracted for at $10,000, and the 2300 feet extension with 36-inch pipe at $60,000.

The Distribution of Gas.—Pending an opportunity of suitably reviewing the work, acknowledgment may be made of the receipt, from Messrs. John Allan and Co., of No. 8, Bouverie Street, E.C., of a copy of the third edition of Mr. Walter Hole's useful book on the "Distribution of Gas." A large part of the matter in this edition has been re-written, with many additions and new illustrations. In an introductory note, Mr. Thomas Newbigging remarks that he has had an opportunity of examining the additions and improvements that have been made, and is struck with the up-to-dateness of them all, and the exhaustive treatment of the various articles. The price of the book is 15s. net.

Gas-Works Directory and Statistics, 1912-13.—There has been sent to us by the publishers, Messrs. Hazell, Watson, and Viney, Limited, of No. 52, Long Acre, W.C., a copy of the "Gas-Works Directory and Statistics" for 1912-13. The contents have been revised up to August last; and by securing, as heretofore, the co-operation of officials of the various gas undertakings, all that is possible has been done to ensure the accuracy of the information published. The price of the book is 10s. 6d. net; and it is an old friend, for the present is the thirty-fifth issue. In addition to the statistics given under the names of the different towns, there is an alphabetical list of chief gas-works officials; and particulars are also given in regard to the Senior and the Junior Gas Associations—including the names and addresses of the Presidents and Secretaries, the numbers of members, and the dates and places of meeting.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

The British Commercial Gas Association.

SIR,—I have been reading the interesting address delivered by Dr. Corbet Woodall before the British Commercial Gas Association, and the report of the General Committee presented at the same meeting; and I cannot but feel gratified that the practice of applying business principles to the selling of gas is being viewed with increasing favour in the industry—from the Premier Company downwards.

More than twenty-four years ago you were kind enough to give the hospitality of your columns to a letter of mine, in which was suggested a drastic change in the attitude of gas undertakings towards their consumers. I therein urged the importance of educative effort in bringing home to the users of gas the fact that, while electricity was much dearer than gas, its hygienic value was less; and that if gas engineers would but place that knowledge at the service of their customers, fit up their houses with the newest and best gas consuming appliances, and accord that policy the same attention as the attainment of low manufacturing costs, the results would be surprising. Many a station manager would have been "called over the coals" for his temerity. But the late Sir George Livesey was ever sympathetic to young men and their ideas; and he proposed that I might be given a portion of the district upon which to try my hand. But the officials of those days thought differently.

Opportunity, however, presented itself soon after my appointment as Chief Engineer; and one of my first acts of freedom was the starting of a Sales Department, distinct from, but co-operating with, those concerned in manufacture and distribution. In the thirteen years which have elapsed, we have built up an organization for dealing with our consumers second to none in the kingdom.

Of the various methods we have adopted, I do not intend to speak here—preferring to work quietly in the attainment of our ends, rather than by "beating the big drum," and thus attracting the attention of our rivals as well as our friends.

But to the latter, our offices are always as open as our works; and to those who are interested in the business of gas selling, we shall always be ready to give any information which lies in our power.

Some advocates of the new forward movement lament that we have not joined it. Our answer is that we have been ahead of it. We were the first London Company to light up an important thoroughfare with high-pressure gas, when others would not interest themselves in its application.

The unique inquiry, referred to by Professor Lewes, into the comparative hygienic conditions of gas and electric lighting, was undertaken at our initiation by Dr. Rideal; and it stands to-day a remarkable example of practical research. The investigation came, however, to an untimely conclusion, because the Premier Company, whom we had interested in it, was unable to see its way to contribute any more funds to the furtherance of its objects.

At the Ideal Home Exhibition, we undertook, single-handed, to appear for domestic gas-lighting, although the site was situated two or three miles outside our district, and practically on the border of two great undertakings. One cannot imagine an "Ideal Home" without gas; and some 300,000 people visited that one.

Our position then with regard to the new Association is that we feel we can spend with greater advantage to ourselves, the large contribution to its funds required as the qualification of membership. At the same time, we are fully cognizant of the interdependence of the industry as a whole (some of our most difficult cases to convert to gas are furnished by potential consumers who move into our area of supply for the first time); and though we prefer to steer a course for ourselves, I am confident that in the future as in the past good will come from our labours, to the advantage also of our friends.

CHARLES CARPENTER.

South Metropolitan Gas Company,
Oct. 12, 1912.

Alliance and Dublin Consumers' Gas Company.

SIR,—I have now had an opportunity of considering the report of the proceedings at the recent meeting of the Alliance and Dublin Gas Company.

While I feel somewhat surprised, and much disappointed, with the Chairman's meagre reply to my criticisms, I nevertheless notice that he agrees with me in respect to the high capital ratio; but he does not offer any explanation of why this has not been attended to in the past, or a solution as to it being remedied in the future. In my opinion, it is one of the principal causes adversely influencing the value of the Company's stock; and I feel that the Chairman scarcely did himself or the stockholders justice in not dealing with this, and other matters, more thoroughly.

It is an extremely significant fact that the 5 per cent. stock of this large British gas undertaking is marked at a discount varying from 20 per cent. to nearly 30 per cent., whereas without the extra 7s. 6d. per cent. dividend, due (but not paid) under the sliding-scale, the value of the stock should stand at quite 5 per cent. premium. If the full dividend of £5 7s. 6d. were paid (and the Chairman offered no explanation of why it was not), the value of the stock should be something like £110 to £115 per cent.; so that, compared with the lowest quotation during the past few months, the stock has been some forty points below the level of a well-managed gas company paying full statutory dividends.

I know something about amalgamations, and the proper policy to be pursued afterwards. If a sound system had been adopted since the amalgamations vaguely referred to by the Chairman—by liberally writing-off obsolete plant, together with a systematic and careful expenditure on reconstruction and improvements of works and plant, out of revenue, instead of being prodigal—there would have been no cause to-day to defend the capital ratio. Even Mr. H. E. Jones, with his

world-wide experience, cannot conscientiously defend such a policy; and if he does, he should explain why, and also, in the face of such an opinion, the reason he is so righteously (and justly) proud of 6s. 9d. at Wandsworth. There may be grounds for some difference, but not to anything like the extent of 11s. 5d. per 1000 cubic feet. Mr. Jones could not tell a Parliamentary Committee that a capital ratio of 18s. 2d. (increasing, rather than otherwise, since the Act of 1909) was justified, or an indication of a sound policy, especially with a company of the size of the Dublin Company. I challenge Mr. Jones to combat or argue this point, together with his reasons for such a high selling price; and if he can justify them, I shall be pleased to acknowledge his efforts. Further, I invite him to say, if the amalgamation he recently carried through Parliament raised the capital ratio to anything approaching 18s. 2d., what he would think of the result of his efforts?

A word or two more. Recently I advocated through your columns amalgamations of gas companies as a means of possibly serving the public and stockholders more economically and efficiently. If the Dublin capital (as explained by the Chairman) is a justification for asking Parliament to sanction amalgamations, then pity help us all! But I am convinced that Parliament looks for different results when approving measures involving amalgamations of gas companies.

The position in Dublin somewhat resembles one which existed with a large English company some years ago. But the remedy ultimately came; and to-day the company in mind is prosperous—paying the full statutory dividends, with gas at a reasonable price, and its stock quoted to return well under 5 per cent. A similar policy must cross the Irish Sea, and stay there. A strong, firm hand must steer the ship, and curb future capital expenditure—insisting, willy-nilly, that this serious handicap of high capital ratio must be reduced. Until then it is somewhat futile to talk about other details; for whatever may be otherwise amiss and liable to trenchant criticism (and I have shown that there are grounds for reviewing the revenue account), the fact that the Dublin Company, in the year 1912 asks its consumers to pay the abnormally high figure of 3s. 4d. per 1000 cubic feet (in my opinion, quite 1s. more than it should be) while the Consulting Engineer to the Company rightly states that a comparison between Dublin and London enterprises was ridiculous, to my mind stands as a record for all time as a perfectly true and honest opinion of the anomaly.

The length of mains, and consumption per mile, &c., had not been overlooked by me; but I did not view the same with the importance the Chairman gives to them. If, however, Irish districts are so sparsely populated, or distances between so great, then the Directors must have been leaping in the dark and trusting to Providence for consumption, instead of carefully weighing the possible return they would receive. Or, on the other hand, if some of the mains were taken over on amalgamation, surely sufficient time has elapsed for this evil to be remedied, as, if I remember rightly, the amalgamations took place so far back as 1866. I am not, however, entirely ignorant of dealing with enormous districts of supply, sparsely populated; and my candid message is that the present results per mile of main can be vastly improved. This is evident from the statement of the Chairman at the meeting: "Since the passing of the Act in 1909 the number of consumers had increased per mile of main." But the Chairman does not tell us to what extent; and one not only inquires the extent of the statement, but why this deficiency was not seen to many years ago.

It is the policy of the Company that I strongly criticize. There has been improvidence in the past; and the outlook for the future does not promise any better. Are the stockholders content after what I have told them in recent months? I should say not, even though Mr. Jones thinks otherwise, and thus describes my criticisms: "A more unfounded, unfair, and misleading comparison could not possibly be made between the condition of things in Dublin and that of London to-day."

As to Mr. R. H. Davis, I do not attach much regard to his statement as to my anonymity, as I have not made any personal attack, nor do I intend to. If he can deal with, or rebut, any of my points, well and good. Otherwise, I suggest that there is no justification for his remark; for my object has not been one of self-interest entirely, but the general interests of the stockholders.

I do not know the Chairman of the Company; and, if he knows my identity, as he says he does—although I doubt it—he will admit that I am quite capable of overhauling and criticizing the affairs of any gas undertaking. And while I do think his remarks were much too brief for the important matters raised of late through the columns of your paper, I thank him for his courtesy so far extended and, at the same time, assure him that it is my wish to avoid any personal or hurtful remark in my communications, and that my attitude will be strongly maintained, and my efforts unrelaxed in the future, until the things I complain of have been rectified.

NONULUS.

Oct. 11, 1912.

Gas Exhibits at Amsterdam.

[TRANSLATION.]

SIR,—As a result of several journeys, it is only to-day that I have been able to read the "JOURNAL" dated Sept. 24; and in it I find your editorial article headed "Last Week in Amsterdam." That which you write about my speech gives the impression that I had compared Dutch gas fires and fittings with German productions, and "much to the disadvantage of the latter." You can only mean my dinner speech.

May I beg you to state in your esteemed "JOURNAL" that in this dinner-table speech I did not mention at all gas fires; and as regards fittings for lighting, I only spoke of those of the Dutch firm Koninklijke Fabriek van Metaalwerken W. J. Stockvis, which certainly seemed to me some of the most beautiful of their kind that have ever been made for gas lighting. Further, what I said of the beauty of the Amsterdam Gas Exhibition did not imply, with reference to other such Continental institutions, what might be inferred from your report.

These misunderstandings have arisen, no doubt, from the fact that the representatives of the various nations spoke each in his own tongue. But I should be extremely obliged to you for a correction much to be desired.

KARL LEMPELIUS.

Berlin, Oct. 8, 1912.

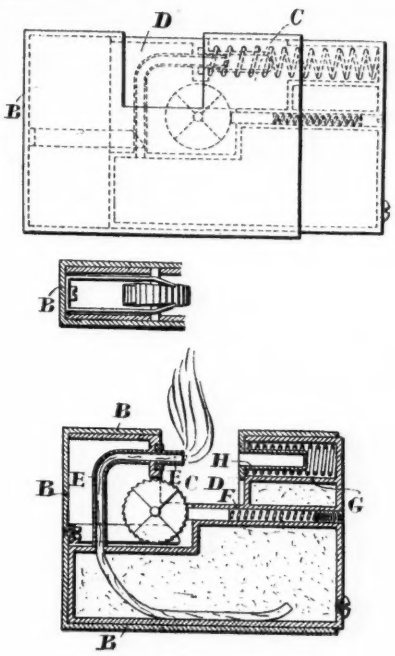
REGISTER OF PATENTS.

Ignition Apparatus.

DANICEK, V., CERNOVSKY, K, and HOFFMANN, A., all of Prague.

No. 19,297; Feb. 28, 1911.

This ignition apparatus is of the kind in which the closing together of two interfitting cases or shells causes two ports to come into register, disclosing a flame kindled by sparks from a piece of pyrophorous metal rubbed by a friction-wheel rotated by the act of closing the two shells. Another feature of the invention consists in the arrangement of an extinguisher tube in the sliding sleeve; the free end of the wick tube being adapted to enter the tube when the apparatus is released—a gas-tight packing being arranged to seal the tube in the closed or extinguished position.



Danicek's Ignition Apparatus.

The lighting device consists of a benzene tank (shown) on which is placed a sleeve B open at one side. Both tank and sleeve are provided with recesses C D passing through the narrow wall and the two wide lateral walls, so that (in the normal, partly extended position of the tank) the sleeve covers the recess C; while in the compressed position the two recesses coincide with each other. The wick tube E projects into the top of the recess C, and a friction-wheel projects below. Opposite the latter is arranged, in the tank, a tube F filled with cerium iron alloy, which is pressed by a spring against the friction-wheel. The wheel is provided on both sides with radial teeth, and to the sleeve are secured two spring pawls which embrace the wheel. When the tank is in the extended position, the pawls do not engage with the teeth of the friction-wheel; but when the apparatus is compressed, they do so, and turn the wheel, whereby sparks are produced. When, however, the tank is being extended, the pawls slide loosely over the teeth of the wheel.

In the tank there is arranged a tube G, in which is placed a helical spring which automatically extends the apparatus by pressing, on the one hand, against the wall of the tank, and, on the other hand, against the transverse wall of the sleeve B. For the purpose of ensuring a tight joint around the wick, a packing-ring is arranged round the wick tube in the transverse wall, while into the transverse wall is inserted an extinguishing tube H closed at one end—the free end of the wick tube passing into the tube when the apparatus is extended and forming a tight joint therein.

When, therefore, the apparatus is compressed, the space C, in which is the lighting device proper, is exposed, and at the same time sparks are produced; so that the wick which is exposed to the air is lighted and remains burning. When the apparatus is no longer compressed, the action of the spring in G pushes the sleeve and the tank apart until the transverse walls engage with each other. The space C is thus closed, and the flame extinguished owing to the exclusion of air.

Producing Gas-Lighted Flash-Signs.

JACKSON, T., of New Cross, S.E., and RAMSAY, A., of Folkestone.

No. 20,368; Sept. 14, 1911.

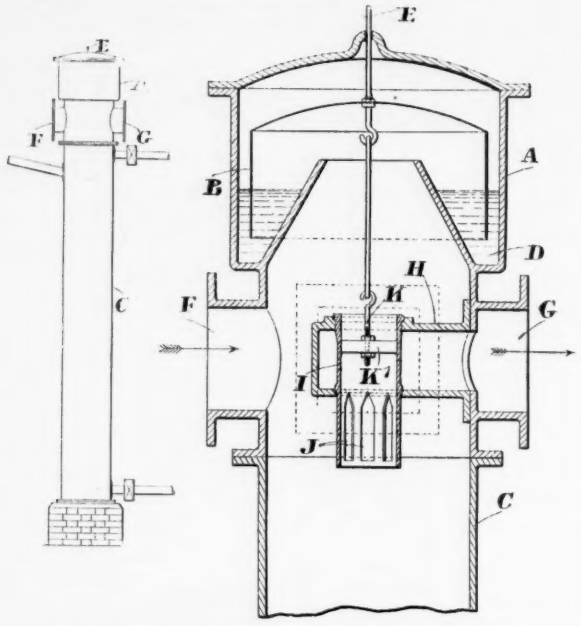
This mechanism for producing gas-lighted flash-signs for advertising purposes consists of a tiltable control valve (such as that described in patent No. 29,977 of 1910) fixed on the movable wall of an expansible chamber adapted to take positions of varying angularity during the expansion and contraction of the chamber produced by its periodic inflation with the gas to be consumed. There are also means by which the moving connections between the gas supply, the burner supply, and the expansible chamber are effected within the chamber itself.

Tar-Tower and Retort-House Governor.

PICKERING, W. S., of Leeds.

No. 20,514; Sept. 16, 1911.

According to this invention, there is provided in an extension of the tar-tower (at the upper end) a floating bell, flexible diaphragm, or other device by which the pressure of the gas or vacuum may be exerted for the purpose of operating a governing valve arranged in connection with the gas outlet.



Pickering's Combined Tar-Tower and Retort-House Governor.

The tar-tower (as shown) is a deep receptacle into which the tar and ammoniacal liquor from the hydraulic main are permitted to drain—the tar sinking to the bottom, where it accumulates and can be drawn off as desired. The upper end of the tower is provided with a receptacle A for a floating bell B, of greater diameter than that of the tower proper C, and enclosing an upwardly projecting conical or other wall, which forms, with the wall of the receptacle, an annular space or trough D for the reception of water to form a water-seal for the floating bell. The receptacle is closed by a cover-plate having a centrally disposed hole through which passes a rod E, by which the floating bell may be supported. Immediately below are provided, in oppositely disposed positions in the tar-tower, an inlet F and an outlet G for the gas. A valve-box H, adjacent to the outlet within the tar-tower, is so disposed that the gas in its exit from the tower must pass through it. "Thus, before reaching the valve any tar or other deposit is separated from the gas." Valve-seats are provided in the upper and lower ends of the valve-box for the reception of a double-beat valve I suspended from the floating bell. The valve is formed as an open-ended cylinder having valve faces on its exterior surface at the upper end and (approximately) at the middle of its length. Immediately below the lower valve face the valve is provided with a series of slots J, which in shape taper to a point at the upper ends, in the plane of the lower edge of the lower valve face. The valve I is suspended from the floating bell by an adjustable screw-threaded member K, provided with lock nuts and secured to a transverse bar, spider, or arms, arranged within the upper portion of the valve.

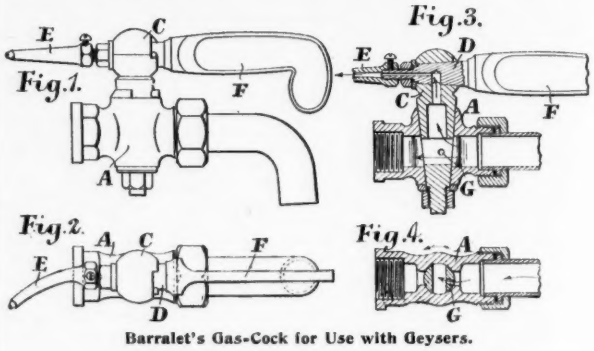
In operation the gas enters at F, and is drawn off from G by an exhauster, which creates a slight vacuum. The floating bell B is lifted, together with the valve I, under the pressure of the gas—thus opening the valve-seats and slotted portion of the valve to the passage of the gas to the outlet through the valve-box. The valve serves to throttle the passage of the gas, should the vacuum increase above the normal, by descending towards the valve-seats; while should the vacuum decrease, the valve is lifted to increase the area of the gas passage, under the increased pressure of the gas in the bell.

Gas-Cocks.

BARRALET, J. H., of Sydenham Hill Road, S.E.

No. 1266; Jan. 16, 1912.

This invention relates to pilot or bye-pass cocks specially applicable to hot-water geysers, in which the bye-pass is first lit, then the main cock is opened, and the bye-pass revolved into the geyser to light the main burner within the geyser. It consists in arranging the bye-pass on the plug of the main cock in such a manner that the handle of the plug is rotated on an axis at right angles to the axis of the plug to turn on the pilot jet, and then the plug is rotated on its own axis by the handle to turn on the gas, and revolve the pilot light into the geyser to light the main burner.



Barralet's Gas-Cock for Use with Geysers.

Figs. 1 and 2 are an outside elevation and plan. Fig. 3 is a longitudinal section showing both the cocks. Fig. 4 a section showing the main cock only.

The hollow plug of the main supply cock A is provided with an enlarged head C, which forms a casing for the bye-pass cock plug D. This plug is arranged with its axis at right angles to the plug A, and is provided at one end with a bye-pass jet E and at the other with the handle F, by which both the cocks can be operated. One wall of the main cock A is perforated by a small hole G, through which the gas passes to reach the cock D. In arranging the cock for use with a geyser, it is connected in the supply pipe near the burner in such a way that when the cock is turned on the bye-pass jet directs its flame immediately over the burner.

In lighting a burner fitted with this cock, the bye-pass cock is first turned on by revolving the lever F through a quarter turn. The bye-pass jet is then ignited, after which the lever is turned about the axis of the cock A, which turns on the main supply and causes the bye-pass jet to light up the main burner. When the main burner has been ignited, the bye-pass can be turned off independently of the main supply.

Controlling Valves at Predetermined Times.

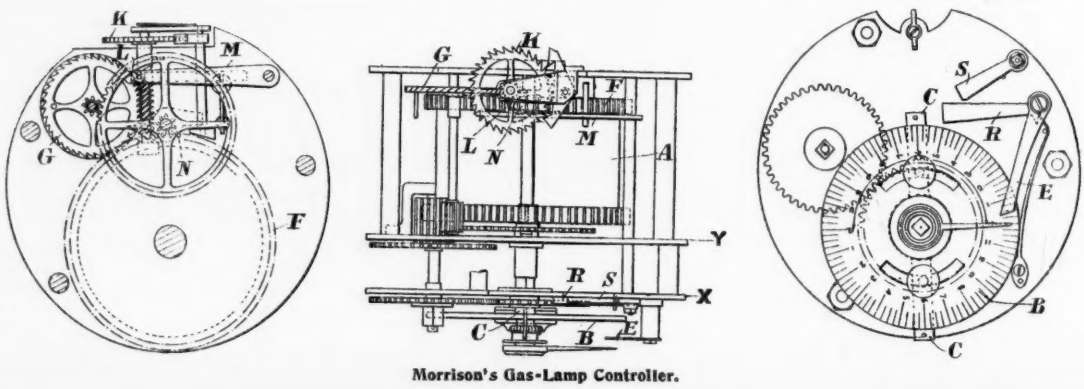
MORRISON, E. J., of Islington, N.

No. 21,439; Sept. 28, 1911.

This mechanism adapted to automatically operate a switch or valve at predetermined times of the day is intended to be employed for lighting and extinguishing gas-lamps either in streets or shop windows, and "ensures that the lamps will only remain lighted between the desired hours."

The illustrations show a sectional elevation of the mechanism for operating the valve or switch, a plan of the mechanism, and a front elevation showing the controller of the time of operation of the valve opening and closing mechanism.

A strong spring motor is contained in the drum A, one end being geared to the gas-valve and the other to the clock-train or timing element (not illustrated) situated between the plates X Y. The controlling device, which is driven by the clock-train, consists of a disc B, which revolves once in twenty-four hours. Adjustably secured to the disc are a pair of levers C, carrying projections which engage a lever E adapted to operate the releasing device for the valve-operating mechanism. These levers may be manually adjusted so that the valve mechanism will be operated at predetermined times twice every twenty-four hours—first to open the valve and then to close it. The valve-releasing device comprises a gear-wheel F driven from the other end of the spring than that which drives the clock-train. The wheel is



Morrison's Gas-Lamp Controller.

connected to a worm-wheel G driving a worm upon the same shaft as a ratchet-wheel K. This ratchet-wheel is normally held against rotation by a pin L carried by the worm shaft engaging a pivoted lever M adapted to be operated by the lever E.

When the pin is moved out of the path of the lever (which it may be, either by hand or automatically by the controlling mechanism), the spring is allowed to unwind a certain predetermined amount and rotate a gear-wheel N mounted on the valve spindle so that the valve is caused to move a certain distance—say, a quarter of a revolution. During this movement, the worm-wheel G is free to rotate. The worm-wheel carries a pin which projects into the path of the lever M, so that it raises the lever into the path of the pin L on the worm-shaft. But as the number of teeth on the worm-wheel is such that the pin on the worm-shaft will only engage the pivoted lever during alternate revolutions of the worm-wheel, when the worm-wheel is freed it will rotate twice before being arrested.

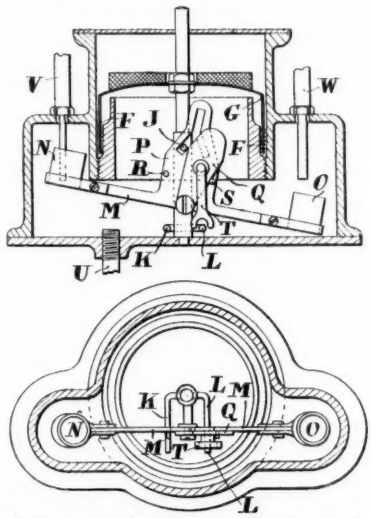
The operation of the mechanism is as follows: The levers C are set opposite the hours on the disc B at which it is desired that the valve be opened and closed. As the disc rotates, one of its pins will come into contact with the lower end of the lever E and move it outwards against the action of the spring shown. A lever R, rigidly connected to the lever E, makes it move downwards as it is forced outwards. As the pin passes beyond the lower extremity of the lever E, the spring forces the levers E R back to the original positions. The lever R, however, in returning strikes a lever S a sharp blow, causing it to move upward and rotate its spindle. The lever M is rigidly secured to this spindle, so that it is also caused to move upward when the lever S is struck and moved out of the path of the pin L, which is therefore free to rotate under the influence of the spring motor. As described, the worm-wheel is adapted to make two complete revolutions before its pin again raises the lever M into the path of the pin L and stops its movement. Meanwhile, the gear-wheel F has rotated sufficiently to drive the pinion N through a quarter-of-a-revolution, thereby causing a key mounted on the spindle engaging the valve to rotate through a corresponding distance and open or close the valve.

Gas-Controllers Operated from a Distance.

DOBSON, E. (Foster Engineering Company), of Wimbledon, S.W.

No. 20,558; Sept. 16, 1911.

This apparatus, for automatically lighting and extinguishing street gas-lamps simultaneously, by temporary increase of pressure, consists of two valves arranged on a rocker adapted to control the bye-pass and service-pipes alternately. Hitherto such a rocker has been operated by a bell or diaphragm on the increase of pressure; but according to the present invention, the rocker is operated through one-half of its motion through the increase of pressure and through the other half when the pressure is relieved—there being thus an appreciable interval of time between the two motions when the rocker is in the horizontal position, with both main and bye-pass valves open to secure the proper lighting of the bye-pass or the main burner as the case may be.



Dobson's (Foster Engineering Company) Gas-Controller.

As shown, the main cylinder is cast with two smaller cylinders, and is fitted with upper and lower cover-plates. Within the main cylinder is a smaller cylinder, leaving between them an internal annular space F, filled with mercury, in which works a weighted bell G, firmly secured to a spindle guided in a tube extending through the upper cover-plate. The spindle is provided with three lifting pins J K and L, which are adapted to operate the rocking gear.

The rocker M, bearing the bye-pass and main-valves N O, is pivoted to the central tube, and carries a plate P with an inverted Y-shaped groove cut in it. Pivoted about the same point is a guide-plate adapted to swing between the stop pins R S arranged on the plate P of the rocker. This guide-plate Q carries a lifting link T, forked at its lower end and adapted to be operated by the lifting pins K L. The inlet pipe U is let into the lower cover-plate, and the bye-pass and main supply pipes V W pass through the tops of the cylinders.

Supposing the rocker is in the position shown, with the main supply open, when it is desired to extinguish the lights the pressure is increased. This raises the bell G, and causes the pin J, which slides in the slot in the rocker, to turn the rocker to the horizontal position, after which the pin L raises the lifting link T and throws the guide-plate Q over to the left-hand side, thus closing the arm of the slot situated on this side. In this position, both valves N O are open, and the bye-pass thus lights from the main supply. On the reduction of the pressure the bell G is lowered, and the pin J, passing down the other arm of the slot, raises the valve O, and thus completely closes the main supply and extinguishes the light. On application of excess pressure again, the reverse operation takes place.

In the case of a group of lights where the whole are required to be lit at one time and only part at another, the bye-pass will be connected direct to the main inlet, and into one cup will be placed the two pipes of the group, which, when exposed, will allow the whole to be lit. The small group pipe will also be connected to the opposite cup, which, when exposed, means the two pipes in the other cup being sealed, and the pipe of the small group left exposed.

LEGAL INTELLIGENCE.

WATER CHARGES TO LICENSED CATERERS.

WESTMINSTER COUNTY COURT.—Tuesday, Oct. 8.

(*Before His Honour Judge* WOODFALL.)

Metropolitan Water Board v. Avery and Burgin.

This was a test case in which the Metropolitan Water Board sued Mrs. A. M. Avery, of the "Crutched Friar," John Street, Minories, and Arthur Burgin, of the "Angel," in the same street, to recover from each defendant the sum of 5s., the equivalent of two quarters' water-rate on the non-domestic scale, in respect of their premises, due to March 31 last. The action of the Board involved a general principle which it was held materially affected licensed victuallers; and the Licensed Victuallers' Central Protection Society of London, in the interest of the retail trade, decided to defend the licensees.

Mr. J. GOODLAND (instructed by Mr. Walter Moon, Solicitor to the Board) appeared in support of the summonses; Mr. E. M. KONSTAM (instructed by Messrs. Maitlands, Peckham, and Co., Solicitors to the Society) represented the defendants.

Mr. GOODLAND, in opening the case against Mrs. Avery, said the point at issue was as to the domestic or non-domestic supply of water, and the amount of the rate sued for was in respect of a non-domestic supply. At the "Crutched Friar," one of the houses in question, catering was done. About thirty luncheons were served there every day, and the water charge was made for the non-domestic supply in connection with the cooking, drinking, and washing of utensils, &c.

Mr. *M. W. Tattersall*, a rating clerk in the service of the Board, said he estimated a charge for the supply of water to the house in question for catering purposes at 2s. 6d. per quarter. He had been a rating clerk to the Board since 1908, but he had not previous to that time assessed upon a public-house for water used in connection with a catering business. It had, however, been the general practice to make such a rate ever since 1908.

His HONOUR: How do you assess it, because I see the water is not supplied by meter?

Witness: As a basis, I should say on about a gallon a meal. There were thirty meals a day, and, with the washing-up, this would soon run away with 30 gallons of water.

Mr. KONSTAM remarked that the claim had never before been made in respect of the "Crutched Friar."

Witness said it was not in force at the time the Charges Act came into operation.

Mr. KONSTAM said this was the first time anything had been claimed by the Board for non-domestic supply in respect of the house; and he was instructed that it was a new charge which it was sought to enforce in the case of public-houses.

Witness said this was not so.

Mr. GOODLAND contended that the water supplied to Mrs. Avery was for domestic purposes, and that it was partly used for non-domestic purposes. Domestic water was not intended for the purposes of any trade, manufacture, or business. The Board held that the water used in the case of Mrs. Avery was for these purposes, and therefore should be paid for accordingly. They might, if they wished, charge licensed victuallers for the water they used in washing-up glasses and cleaning windows; but, out of regard for the high rateable value of such premises, they did not do so. However, they must draw the line somewhere; and they drew it where there was a catering business.

Mr. KONSTAM submitted that his learned friend could not succeed in either case. It was not suggested that catering was now done at the "Crutched Friar" for the first time. Such a business had probably been carried on there ever since the house became licensed, and the owner had never been charged anything beyond the amount of the ordinary water-rate. Counsel cited the case, *Lyons v. Lord Mayor of London*, which had reference to the distinction between public-house refuse and trade refuse. He also referred to the decision in the case *Metropolitan Water Board v. Colley's Patents, Limited*,* and to those given in other cases, and showed that, though the "Crutched Friar" was carried on for the purpose of a trade and catering, yet the water supplied to it came within the definition of domestic purposes.

His HONOUR said he thought his decision must be for the plaintiffs. He recognized that the point raised was an important one, though the amount involved in the present action was merely nominal, and it was really a test case. Both parties had signified their intention to appeal to a higher Court to obtain an authoritative decision upon the question; and for this reason he did not think it necessary to take time to consider his judgment. He thought it was a case that should be taken to appeal. For some time water had been supplied to the houses in question, and used for non-domestic purposes, while no demand had

* See "JOURNAL," Vol. CXVI., p. 545, for the House of Lords decision in this case, and for references to the earlier proceedings.

been made upon the defendants, other than under section 8 of the Board's Charges Act. There was no suggestion that the defendants had acted in a manner which was not perfectly *bona fide;* and he found it impossible to come to the conclusion that a request was implied to supply water for trade purposes. The great question in these cases was whether the water had been used for these purposes; and he was of opinion that in the present case it had. He thought the plaintiffs were entitled to claim a reasonable sum under section 18 of the Water-Works Clauses Act, 1863; and there must be judgment under this section for the amount in question.

Leave to appeal was given, with costs on the higher scale. Pending the result, the hearing of the case against Mr Burgin was adjourned.

CUTTING OFF A SUPPLY OF GAS.

Substantial Fine for Assaulting a Manager.

At a sitting of the Knutsford Police Court last Wednesday, the Knutsford Light and Water Company, represented by Mr. E. L. Ashworth, solicitor, prosecuted Edward Masheder, Secretary to a local firm of mineral water manufacturers, for assaulting their Manager, Mr. F. H. Robinson. There were cross-summonses in which Masheder charged Mr. Robinson and Fred Thomas, foreman at the gas-works, with assaulting him.

The case for the Company was that after the usual warning notice had been sent to Masheder with reference to a sum of £6 owing for gas and water, and no payment being made, the Manager, with the foreman, went to the mineral-water works to cut off the supply. Upon learning their business, Masheder became most abusive; and when Mr. Robinson attempted to go down into the cellar he assaulted him. On Thomas going to assist his chief, he was knocked about. Mr. Webb, collector for the Company, in the course of his evidence, said Masheder "acted like a madman."

For the defence, it was submitted that Masheder was under the impression that the officials named had no legal right to enter the premises in the manner they did, and he ordered them away. Following this there was a scuffle. In the witness-box, Masheder said it was quite true the firm owed the account; but he had explained to the Company that one of his Directors was away in Canada, and he could not obtain his signature to a cheque. Defendant said he did not object to Thomas going into the cellar to cut off the gas, but he had an objection to Mr. Robinson doing so; and when the latter attempted to brush him aside there was a struggle.

The Magistrates were satisfied that an entirely unjustifiable assault had been committed by Masheder; and they imposed a fine of £3 and costs, the alternative being a month's imprisonment. The cross-summonses were dismissed.

Defaulting Gas Consumer Seeks Lenient Treatment.

At the Thames Police Court last Friday, before Mr. Leycester, Charles E. Popplestone, described as a schoolmaster, of East India Dock Road, Poplar, was summoned by Mr. E. W. Whieldon, Chief of the Rental Department of the Commercial Gas Company, to show cause why he should not be committed to prison in default of paying £3 19s. 1d. owing for gas supplied. Mr. George H. Young, who appeared in support of the summons, was handed a letter which defendant had sent to the Court. After perusing it, he said he could not agree to defendant's suggestion that the matter should be referred to the County Court, and asked that an order should be made against him. He understood Popplestone had given the Company as much trouble as possible. Defendant was a master of French and literature at the George Green School, and he (Mr. Young) was told unofficially that he was earning £200 a year. But the fact of his being a master of French and literature was *primâ facie* evidence of his ability to pay his gas account. On the 20th of September an order was made for him to pay £3 19s. 1d., and he had not done so. Defendant had been kind enough to tell them that all his goods were covered by a marriage settlement. Mr. Leycester: "Very convenient." His Worship made an order for defendant to pay the amount named and 3s. costs, or in default would be sentenced to 20 days' imprisonment. If the money was not paid by the following Monday, judgment would issue forthwith.

Price of Gas in Sowerby Bridge Out-Districts.—On the recommendation of the Gas Committee, the Sowerby Bridge Urban District Council have agreed that the price of gas to all the outside districts shall be reduced 1d. per 1000 cubic feet (from 2s. 7d. to 2s. 6d.).

Woodall-Duckham Vertical Retorts for Birkenhead.—The Birkenhead Corporation have received the sanction of the Local Government Board to loans of £31,421 and £3500 for the erection of an installation of Woodall-Duckham vertical retorts in connection with their important gas-works extension, to cost ultimately £114,000, and for the provision of foundations. For the latter, the tender of the British Reinforced Concrete Company, Limited, of Westminster, has been accepted.

Successful Gas-Iron Campaign.—Mr. V. W. Kennedy, the New Business Manager for the Gurney (Ill.) Gas, Electric, and Heating Company, writes in "Progressive Age" as follows: "We are carrying on a campaign on gas-irons at present, and sell the irons for $3·50 and make our collections in this way: 50 c. after the iron has been installed and we know the customer is satisfied, and 75 c. a month with the next four months' gas bills. We absolutely guarantee the iron to be perfectly satisfactory to our customer; but should a consumer be in any way dissatisfied with the iron, it can be returned, and we will refund any amount of money which he or she has paid. We have our soliciting crew divided up, and have a captain to each crew, who is paid a certain commission on all irons sold. So far we are meeting with very good success. It seems that all the people are finding out what a gas-iron is, and we are selling more every day."

MISCELLANEOUS NEWS.

GAS REGULATION IN NEW SOUTH WALES.

The Companies' Case Before the Legislative Assembly.

In the New South Wales Legislative Assembly on the 4th ult., the case against the Gas Regulation Bill, to which several references have lately been made in the "JOURNAL," was submitted by three barristers who appeared on behalf of the Companies specially concerned—viz., the Australian Gaslight, North Shore, and Newcastle Gas Companies.

The Australian Gaslight Company's Case.

Mr. ADRIAN KNOX, K.C., in bringing forward the objections of the Australian Gaslight Company to the Bill, said he was quite conscious that he was speaking nominally for what had been termed an impersonal corporation; but he might add that the corporation, which he was quite conscious was, in the minds of some people, at any rate, unpopular, consisted of a great many individuals. It was on behalf of the 1600 or 1700 people who were shareholders, and the 3000, or thereabouts, of individuals who depended largely on the income derived from the Company for sustenance, that he was before the House. As far as his researches and those of people who had been associated with him went, this was the first time that any Bill had been seriously presented to any House of Parliament in the British Empire proposing to take from one person certain property and give it over to another. The Australian Gaslight Company was incorporated in 1837, when gas lighting, even in England, was in its infancy. It was incorporated by an Act of that House, which placed no restrictions on its profits or what it should do with them. It had carried on business ever since, and had not committed any unlawful act. It would be his duty to address honourable members as to the treatment which it was now proposed to mete out to the Company, and to contrast it with the treatment accorded to similar gas companies in the United Kingdom. Before 1847 there were a number of gas companies in England, both under Acts of Parliament and non-statutory. In the year named, the Legislature, presumably seeing that gas supply was going to become a big industry, passed an Act containing certain provisions in connection with the industry. It was carefully guarded not to touch gas companies who were already established, provided that, in the case of those which did not come under the Act, the dividend should be limited to 10 per cent. Parliament gave the companies fair warning; they did not take away from any existing company its existing right to pay a higher dividend. The Australian Company had since 1875 paid regularly a dividend of 18s. a share; and during the last 25 years the market value of the shares had ranged between £12 and £20 (£6 paid)—the variation not being due to any speculation or gambling, but simply to the fact that since 25 years ago the value of money in the market had become less.

POSITION OF THE SHAREHOLDERS.

He had had analyses made of the shareholders of the Company, of whom there were 1637. One analysis showed that of these shareholders 800 were women, and of the entire number 1068 owned less than 50 shares apiece; 271 owned between 50 and 100; and altogether there were only 298 who held over 100 shares each. Of the 298 shareholders, 140 were trustees, who held the shares on account of 307 different trust estates. There were not more than 100 or 120 shareholders who had over 100 shares in their own right. Of the 1637 shareholders 1533 had bought their shares during the last 25 years. So that all the shareholders except 100 had actually paid from £20 upwards for every share they held in the Company. These figures showed that the shareholders of the Company represented mainly what might be called, not the wealthy class, but the class who had saved a certain amount of money, and had put it into this form of investment for the purpose of getting a regular and steady return, which would not be a great deal higher than that from ordinary Government securities. The return, as a matter of fact, to anyone who had bought within the last 25 years had never exceeded 7½ per cent., and had generally run to about 5 per cent. It was ridiculous to talk of these shares as the subject of speculation. It was a notorious fact that they had always been regarded as a gilt-edged investment.

LIMITATIONS OF THE BILL.

The Bill was limited in operation by clause 3 to three Companies; it was not a General Gas Bill. It was limited to three Companies, and such others as happened to be put in the schedule afterwards. It was directly aimed at these three Companies. Why were the others omitted? It would be said sooner or later that, in the Act of 1883—the Australian Gaslight Company's Act—a clause was inserted under which the Company was given notice that if any general gas legislation were introduced it would have to come under it. This was not general gas legislation—being aimed at three Companies only. There were others in New South Wales who were paying from 10 to 15 per cent., and had been doing so for years. Why were they not included? There could be no reason except that these large Companies had been attacked by the Bill. There were certain clauses to which his Company offered no serious objection. Speaking generally, they were perfectly willing to submit to all the standards and tests imposed by the latest English legislation. But these were not the standard tests proposed by the Bill, because the standard prescribed had been discarded in the latest English legislation. The real objection to the Bill from the Company's standpoint was in the clauses which it had been suggested were based upon, or corresponded to, similar legislation in the United Kingdom. No more misleading suggestion could possibly be made. The half-truth was harder to fight than the statement with no truth in it. A sliding-scale with a standard price and rate of dividend was in force in England; and to this extent the suggestion was true. It must be patent to everybody that the justice, as well as the efficacy, of a sliding-scale depended upon the figures inserted—what were inserted as the standard price, dividend, and so forth. It was in the

insertion of these figures that a departure had been made from the English legislation. In England, besides the difference in detail, there was a vital difference in principle. He had not been able to find a single English Act dealing with the affairs of any English gas company which did not preserve the existing rights of every shareholder. This had been the principle which had guided the British Parliament from the day when it passed the Gas-Works Clauses Act in 1847 up to the present. It had never taken from any shareholder a penny of his property, nor had it prevented any gas company from making an income and paying the dividend which it could have done before the Act was passed.

Reduction of Dividends.

The effect of clauses 13 to 19 of the Bill would be that for one year the Company would be entitled to pay a dividend of 7 per cent.; the next two years, 5½ per cent.; and thereafter 4 per cent.—all this being on the assumption that the price of gas was not reduced. If this were done, the capital value of each share would be immediately lowered to less than £5. What a man had paid from £12 to £20 for, would become worth less than £5; and the reduction of the income would be from 18s. per year per share—first to 8s. 6d., then to 6s. 6d., afterwards to 4s. 9d. So that the owner would be involved in a loss of from 60 to 70 per cent. on his capital, as well as 50 per cent. on his income; and no one would be a halfpenny better if the price were not lowered. In addition, it must be obvious to everybody that, if this state of affairs came about, the value would not only be reduced to £5, but would not be saleable at that. It might be suggested that the Company would reduce the price, and so increase the dividend; but on the scale provided for in the Bill they would have to drop the price to 2s. 9d. per 1000 cubic feet to pay a dividend even of 7 per cent. This dividend would still involve the shareholders in the loss of more than half their capital and half their income. It was true that, if the prices were reduced to 2s. 9d. the consumer would benefit; but he would do so at the expense of the shareholders. It had never been done before, and he hoped it never would be done.

No Profit Possible.

In addition to the iniquity of the result, it could be shown that it was utterly impossible for the Company to sell gas at 2s. 9d. per 1000 cubic feet and make a profit. He would take the case of three of the principal English Companies—the Gaslight and Coke, the South Metropolitan, and the Commercial. These three Companies supplied the whole of London and a great part of the suburbs. For 16 years (1896 to 1911), the average price of gas was rather over 2s. 7d. per 1000 cubic feet, and, in addition to this, some of them, during the whole time, and a part of the time, were entitled to charge a meter-rent of 1½d. for ordinary meters; so that the cost to the consumer would be in the neighbourhood of 2s. 8½d. The cost of coal to the Company was approximately the same as in Sydney.

Comparison of Prices.

It could be proved before any Committee that the cost of manufacture and distribution of gas in Sydney compared with the cost in London was not less than 10d. more per 1000 cubic feet—3d. was spoken of by Mr. Lukey (the Secretary) before a Select Committee; but it represented merely the extra cost of labour in the works. If one took into consideration the difference in the sale of residuals and the cost of manufacture and so on, it could be established that 10d. was the extra cost of manufacture and distribution of gas in Sydney compared with London. The London Gas Companies had averaged during a period of ten years a dividend of something over 9 per cent. per annum on the original capital—that which it was proposed to allow a gas company to pay in Sydney. To pay this dividend on the same footing, it would be necessary to sell gas at 3s. 6d. per 1000 cubic feet. But on the figures supplied in the Bill, before the Gas Company could legally pay a dividend, even if it could earn it, of 9 per cent., it would have to reduce the price of gas to 2s. 1d., which was 6d. below the price in London. These figures showed conclusively that there was some vital difference between the figures provided in the Bill and those upon which the English Acts of Parliament were based. [The learned Counsel quoted the case of the Commercial Gas Company in support of his argument.] Every Act ever passed in England which had reduced the dividend to 4 per cent. had been accompanied by a similar provision multiplying the capital by 2½ times in the case of the original 10 per cent. at the time the company applied for the Act.

An Interruption by the Speaker.

The Speaker here pointed out that it was laid down as a general principle that a Public Bill, being of national interest, should be debated in Parliament upon the grounds of public expediency, and that argument on either side should be restricted to members of the House. It was not a question of what was done in England—whether it was expedient to do it in Australia. This was the business of Parliament. He asked Mr. Knox to confine himself to the business side of the question, and not deal with the policy of the measure.

The Speaker's intervention was greeted with vociferous cries of "Shame" from the Opposition.

Mr. Knox: Honourable members will understand that the only duty of Counsel appearing at the Bar of the House is to obey the instructions that are given by the representatives of the House. I will therefore say nothing more about the English legislation. With regard to the Bill, I will say very little more about that. The major part of my argument would have been based upon the comparison of this legislation and that of England.

The Speaker said he recognized that the persons Counsel represented had interests at stake. If these would be affected by the proposed legislation, he would have full opportunity of dealing with it; but he must not reflect upon the action of Parliament. [Opposition cries of "Shame."]

Mr. Meagher said that, in view of the fact that the Minister, in introducing the Bill, had made a comparison with the English Acts, it might assist the House if Mr. Knox were allowed to do the same.

The Speaker: It is not for me to allow Counsel to take up the position of a representative of the people. It is my duty to preserve the interests of the people in Parliament assembled; and the position is very clear. If there are any pecuniary interests, then they will be represented by Counsel. These interests are distinct from the general interests of the country. It is not my opinion; it is that of the highest authority in the realm. I must ask Mr. Knox to confine himself to the question. [Ironical Opposition cheers.]

A Request by the Premier.

The Premier at this point rose, and, addressing the Speaker, requested, on behalf of the Government, that he would allow Counsel the largest scope to put his phase of the question from the standpoint of the shareholders of the Companies. [Opposition cheers.] He said he was making this suggestion because he considered that it was not only the desire of members of the Government, but of members of Parliament who supported legislation of this kind, to have the fullest information possible at their disposal, and to be convinced that they were doing no injustice to anyone. He made a special request, so far as the Government was concerned, that the Speaker should give the fullest scope to the representative of the shareholders of the Company, as was claimed for the Minister in introducing the Bill. [Loud Opposition cheers.]

The Speaker: The fullest latitude I can possibly give to anyone who is not a member of Parliament will be given to Mr. Knox and other Counsel. The direction I have given will be observed.

This statement was received with vigorous and repeated cries of "Shame" from the Opposition benches.

Counsel Proceeds with the Case.

Mr. Knox said he would not occupy the time of the House much longer. [Cries of "Go on."] He had only a few words to say as to the provisions of the Bill as they particularly affected the shareholders of the Australian Gaslight Company.

The Special Purposes Fund.

With regard to clause 14, relating to the formation of a special purposes fund, he desired to point out in the shortest possible manner that it contained a greatly objectionable provision from the point of view of the Company. The proposed contribution to this fund, limited to 1 per cent. on the paid-up capital, would amount on the existing capital to £8500 a year, and, if the capital were increased, as suggested before, to £12,750 a year. In the first place, 1 per cent. on the paid-up capital would, in the opinion of the Company, be entirely inadequate to provide a special purposes fund. This could be shown by the fact that in the coal strike of 1909 the loss to the Company amounted to £70,000, and with the rapidly increasing business it was clear that a similar strike now or in the future would involve a far larger sum. The contribution to this fund was, however, though important, a matter of detail, but there was one provision of the clause to which grave objection was taken. It was that which required the certificate of some person appointed by the Minister in addition to the certificate of a chartered accountant, being the Auditor of the Company, as a condition precedent to the application of this fund. For this provision there was neither precedent nor reason. It was difficult to see that any proper object could be served by the requirements that the Auditor's certificate should receive the concurrence of a person appointed by the Minister. It would hardly be suggested that a chartered or incorporated accountant would improperly issue the certificate; while the provisions of the Bill would not require that a person appointed by the Minister should be an accountant, either chartered or incorporated or otherwise. If the person appointed by the Minister should be an accountant, there was no reason to suppose that he would differ from the chartered accountant employed by the Company. If, on the other hand, the person appointed by the Minister were not an accountant, he would probably not be competent to determine whether or not the proposed expenditure was proper, or to check the certificate of the accountant appointed by the Company. No one would suspect that a chartered accountant, even though he were the chartered accountant for the Company, would give an improper certificate. In the absence of any reasons to the contrary, the Company contended these these provisions should not be followed.

Renewal and Repairs.

With regard to clause 15, there was no reason for limiting the reserve fund to 10 per cent. on the paid-up capital, nor was there any reason for limiting contributions to the fund, seeing that the only money that could be paid into it was money which the Directors might, had they chosen, have distributed among the shareholders in dividends. He was sure this had been overlooked. It was the shareholders' money.

Concluding Observations.

The only other clause on which he could say anything was that relating to the sliding-scale. With regard to this, the virtue or efficacy or justice of a sliding-scale depended entirely upon where the figures began to slide down and where they went up; "and as it is impossible," added Mr. Knox [turning to the Speaker], "under your ruling, Sir, for me to illustrate my meaning, by reference to other sliding-scales, I have nothing further to add in regard to that clause." As to the clause which provided that whenever the Minister certified that it had been proved to his satisfaction that the Gas Company had suspended the supply of gas, the Government might come in and take possession of the works and appoint a manager, who might carry on as long as he thought fit, and at the expense of the Company, Counsel suggested that this was a clause that might be used to the detriment of a company such as the one he represented. "Beyond that," concluded Mr. Knox, "I am unable to go, owing to it not being within my power, Mr. Speaker, as you pointed out, to compare this legislation with English legislation. [Opposition cheering.] This was the gist of my argument; but as I cannot follow that line of argument, I cannot usefully detain honourable members longer." [Prolonged Opposition cheering.]

Counsel then withdrew.

The North Shore Company's Case.

Mr. B. R. Wise, K.C., was then introduced, and addressed the House on behalf of the North Shore Gas Company. Having thanked the House for the permission granted to the Company to be repre-

sented before them, he proceeded to deal with the clauses of the Bill. He said the pivot of the sliding-scale was the standard price, because if this were fixed too low, there was not a sufficient margin for such a reduction in the selling price as would materially increase the dividend. Thus the inquiry must be directed to two questions: (1) What is a fair standard price? and (2) What is a fair rate of interest? He proceeded to consider first what light was thrown by English experience upon the solution of these questions. He submitted that with the standard price at 3s., and the standard dividend at 4 per cent. it was quite impossible to bring up the 4 per cent. to the present rate of 10 per cent. unless the price of gas was reduced by 24 penny stages, from 3s. 1d. to 1s. 9d. He asked, Was this a fair rate of interest or not? Whether it was possible to produce gas at this price was a question of evidence, and evidence only. It was impossible to make gas at 1s. 9d. per 1000 cubic feet. It was hardly possible to do it in any part of the world, though it had been done in exceptional circumstances. But he pointed out the impossibility of making a profit at this price. They could only be guided by the experiences of older countries. In order to see if 1s. 9d. was a feasible rate for the North Shore Company, it was necessary to see at what price gas could be produced and sold in other parts of New South Wales and in other countries. This involved a preliminary inquiry as to the difference between the cost of producing gas in North Sydney and elsewhere; and this was difficult, since circumstances differed. There were certain elements which entered into the cost of production, such as: (1) Cost of the construction of plant; (2) cost of renewals and repairs; (3) cost of labour; (4) profits from residuals; and (5) density of the population. Having dealt with these points, Counsel said the Company asked for the price granted in London, with a fair allowance for extra expenditure in production, and they would be content with a sliding-scale on this basis. To the London price must be added the meter-rent, for which a fair allowance would be 2·29d. But this was not all. Only three Companies returned 10 per cent.—the others returned 11 and 13½ per cent. Why should the North Shore Gas Company be forced to sell at a lower price and pay a lower dividend? After referring to the charges made by municipalities, Counsel proceeded to show that the standard price of 3s. 9d. was not justified by any English precedent; that the average standard price in England was higher; and that the low price charged in a few cases, which were, after all, only a very small fraction of the 513 undertakings in Great Britain, were due to special local conditions which did not exist in New South Wales. As to what was a fair rate of dividend, he said he believed there was not a single instance in which the standard rate had been reduced without the stock of the company being converted so that the return to the shareholders at the new rate might be the same as it was at the old. He submitted that 4 per cent. was not a fair standard rate of dividend for undertakings so comparatively speculative as gas companies. Counsel characterized the Bill not as a Gas Regulation Bill, but as one to "expose anybody who makes gas to uncertain penalties." In conclusion, he said that of all the rights of individuals there was none more necessary in the interests of civilization to protect against invasion than the right of private ownership; and this the present Bill attacked.

The Newcastle Company's Case.

Mr. Wilfrid Blacket, K.C., submitted the case of the Newcastle Gas Company, and showed the position his clients would be in if the Bill were passed. He said the Company was established in the year 1867, with a paid-up capital of £66,130, on which dividends had been paid. Some of the shares, however, had since been purchased at prices ranging from £2 to £4; and the total amount of the premiums paid was £21,130. For three years after the formation of the Company, no dividend was declared. Later on 6 per cent. was paid; and this gradually increased until in 1871 the dividend was 8 per cent. In 1883, this was increased to 15 per cent.; in 1893, it was 12½ per cent.; and in 1898, 15 per cent. Some of the shares had been purchased at £6 18s. Buyers, however, at this rate only received 4½ per cent. on their investments. His clients had from time to time reduced the price of gas, while they had increased their manufacturing plant. In 1867, the price was 15s. per 1000 cubic feet. This was reduced to 12s. 6d. in 1881, to 9s. in 1891, to 5s. 3d. in 1892, and at the present time it was 3s. 7½d. The price of gas, of course, depended largely upon the density of the population served by the plant. If the conditions existing at Newcastle were compared with those of Sydney and the suburbs, it would be seen that the price of gas was very reasonable. At one time, the Company were enabled to gain considerable revenue from bye-products; but there was competition in this direction now, and it would be useless for them to look to this source in the future with the same degree of certainty as before. At the present price of shares—£6 15s—the value was estimated at £223,188. The assets were reckoned at £167,319, which included land, plant, &c. If the Bill were passed, there would be a loss in the goodwill of the shares amounting to £55,869, because the prices would fall in response to the Company's reduced earning powers. The standard value of the shares, at a 4 per cent. rate, would fall away to £1 16s.; and thus there would be a total loss of £59,514. That was to say, if the Bill passed, and 4 per cent. were the standard dividend, the capital of the Company would be reduced in value from £225,000 to £163,000. If the figures were taken another way, it would be seen that the assets of the Company, assessed at £167,319, would be reduced to £107,000. With the limit of dividend payable, the assets would be worth less to the Company than if they were used for some other purpose than the making of gas. No other producing industry in the State had its dividend limited to 4 per cent.; and no investor would put his capital into a concern which would not pay more than this rate. If the Bill passed in its present state, there would be an absolute loss to his clients of so much in the value of their property; and the man who had paid £6 15s. for a share would be left with something which would be worth only £1 16s. and, it might be, would be not saleable at this. The provisions of the Bill which reduced the dividends from their present rate to 4 per cent., and took no consideration of the income derived from reserves, would inflict a hardship on his clients. All that the Company had done was lawfully done; and a just way to treat them would be to preserve to them all they had acquired under the existing laws. In conclusion, Counsel expressed the belief that members would hesitate long before passing the Bill in its present form.

General Debate.

At the close of the addresses, Mr. Wade asked that the debate might be adjourned so that members could consider the speeches of Counsel. Another member remarked that they could not be expected to digest the speeches before the concluding stage of the Bill the next afternoon. Mr. Fitzpatrick characterized the Bill as "a measure of spoliation," and said the Minister's arguments had been torn to shreds by the speeches of Counsel.

The debate was proceeding at a late hour.

WELSBACH LIGHT COMPANY, LIMITED.

The proceedings were quite short at the annual general meeting of the Welsbach Light Company, last Wednesday, at Winchester House, E.C. The new Chairman is Mr. Felix Kallmann, who usually resides in Berlin; and in his absence, the gathering was presided over by Mr. J. R. Yates, the Vice-Chairman.

In moving the adoption of the report and accounts, Mr. Yates said that before proceeding to an examination of the figures contained in the accounts, it might be as well to recall very briefly the position as it existed on March 31, 1911, when the old Welsbach Incandescent Light Company went into liquidation. A new Company was formed to acquire as a going concern all the assets of the old Company, for a consideration which included the taking over of the liabilities. To enable these operations to be carried out, the parent Company subscribed or paid for 100,000 £1 shares in the new Company, and agreed to guarantee the principal and interest of the debenture stock. For this, the parent Company received a further number of ordinary shares, which, in fact, gave it a preponderating voice in the control of the Company and its operations. It was formerly the practice to make up the accounts to March 31; and a continuance of this custom with the new company was considered convenient. During a part of the past financial year the liquidation of the old Company and the completion of the purchase by the new Company were in progress. These operations involved a good deal of time and thought, and no little unproductive work on the part of the officials and staff. The change in control, and the bringing of fresh minds to bear on the problems presented by the business, led to alterations in organization which it was hoped would eventually benefit the undertaking. He then proceeded to deal with the accounts, remarking that the last accounts of the old Company were for the year to March, 1910. The figures for the following year (when the Company went into liquidation) had, however, been duly audited, and so were available for comparison. The receipts from the Austrian Company were some £10,000 down, representing the difference between a dividend of 12 per cent. and one of 20 per cent. This dividend was for the 1911 financial year of the Austrian Company; but since March 31 last they had received the dividend for the twelve months ending at that date, which was at the same rate as for the previous year—namely, 12 per cent. The profit and loss account of their Company for the period under review showed a debit balance of £4952. The balance-sheet showed cash at bankers and in hand at March 31 of about £40,000. Goodwill, patents, patent rights, trademarks, &c., &c., figured in the balance-sheet at £12,700. This was an item which in the old balance-sheets required no less than seven figures to represent it. Having alluded to the Company's electric lamp business, he went on to say that, in regard to gas-mantles, the turnover for the past year showed a substantial increase; and for the current year to date, the mantle sales were larger than they had ever been for the same period in the history of the business. The prices obtainable, however, left much to be desired. The position demanded, and received, the greatest care, watchfulness, and discrimination, so that no business possible and profitable might escape them; and they were taking up several new lines, from which satisfactory results in due course were anticipated. The period under review had been one of transition; and it was only by approaching the consideration of the figures with this fact kept constantly in mind that a reasonable or appropriate judgment could be formed. He had recently (together with Mr. Kallmann) inspected the Company's factory at Wandsworth, and was greatly impressed with the general efficiency and the up-to-date conditions which were prevalent there. There had recently been effected, and were still being carried out there, certain changes and improvements, which were calculated to further increase the efficiency and capability of these works. A good deal had been said lately as to the responsibility, not only of directors, but of shareholders also, for the conditions under which their employees work. Well, it struck him at Wandsworth that the conditions were such as to leave nothing to be desired, and to reflect credit on the Manager and all concerned. The officers at Welsbach House, too, had given the Company most energetic, loyal, and devoted service during a period of considerable stress.

The motion for the adoption of the report and accounts was seconded by Major G. Pringle, and agreed to *nem. con.* Before the resolution was put to the meeting, however, a few questions were asked by shareholders; and in reply to these the Chairman said it had not been the general custom to have the Austrian accounts translated and furnished to the shareholders of the Welsbach Company; but proprietors who desired information could obtain it from the office. As practically the whole of the Austrian shares were held by the Company, it was really not possible to say what was the market price of them.

High-Pressure Gas for Stalybridge.—A scheme for the better lighting of Stalybridge has been adopted by the Town Council, on the proposal of the Gas Committee to lay mains for high-pressure lighting; the work to be proceeded with immediately. Under the present system of lighting, four burners in one lamp are equal to only 400 candles; but with the high-pressure system the illuminating power of one burner will be equivalent to 1000 candles. The high-pressure gas will be available for workshops and mills.

AMSTERDAM CORPORATION GAS UNDERTAKING.

Report for the Year 1911.

We have received, through the courtesy of the General Manager, Heer J. van Rossum du Chattel, a copy of the report and accounts for the past year of the Amsterdam Corporation gas undertaking.

The report states that the gas consumption in 1911 did not show so great an increase as in the previous year, owing doubtless to the extraordinarily warm summer, and to the coming into force of a shop-closing order in the latter months of the year. The increase for the year was only 1·47 per cent., as compared with 4·88 per cent. in 1910. The report proceeds to refer to the progress of the constructional work at the new South Gas-Works, of which an account was recently given in the "JOURNAL" [see Vol. CXIX., p. 811].

At the West works, mechanical coke-conveying plant was brought into use in February. Two sets of blue water-gas plant were converted into two sets of carburetted water-gas plant on the Humphreys and Glasgow system. A number of settings have been repaired, and new furnaces put in. At the East gas-works, the framework of the glass roof of the retort-house was renewed, and a concrete stage put in in place of the iron stage between the rails and the viaducts. A number of settings were renewed, and extensions were made in the mechanical coke-conveying plant. Substantial repairs and renewals were also carried out in the boiler-house and the sulphate-works.

The production of gas during the year was 93,084,780 cubic metres (3,287,382,090 cubic feet), of which 27·61 per cent. was carburetted water gas. The East gas-works produced rather over 60 per cent. of the total production. The two retort-houses at the West works each contain forty producer settings of nine retorts, making a total of 720 retorts; and the retort-house at the East gas-works contains the same number of settings and retorts. The coal tar produced was equal to 4·168 per cent. by weight of the coal carbonized. The tar was treated in centrifugal separators, and none was sold containing more than 3½ per cent. of water. There were also produced about 1244 tons of carburetted water-gas tar. The sulphate of ammonia made was equivalent to 18·8 lbs. of sulphate per ton of coal carbonized. The length of distributing mains, ranging from 4 to 47 inches, increased by 3½ miles during the year, and amounted to 256 miles at the end of the year. There was a considerable increase in the number of public lamps in the course of the year. The majority are fitted with Kern burners. The mantles used in public lighting had an average life of 261 burning-hours, compared with 329 burning-hours in 1910. The total number of ordinary meters in use at the end of the year was 48,633, and of prepayment meters, 66,846. The proportion of the total sales of gas for which prepayment meters were responsible was 40·55 per cent., as against 39·68 per cent. in 1910. The mantle factory at the East works continued to make both collodionized and uncollodionized mantles for public lighting, for prepayment meter installations, and for municipal use. One lb. of thorium nitrate, with 0·01 lb. of cerium nitrate and 0·004 lb. of glucinum nitrate, serves on the average to impregnate 294 mantles.

In regard to the staff, it is mentioned that Dr. L. J. Terneden was transferred from the position of chemist at the West gas-works to that of Assistant-Engineer to the South gas-works. The total number of officials on the staff of the undertaking was 236 at the end of the year; and the number of permanent workmen was 1498.

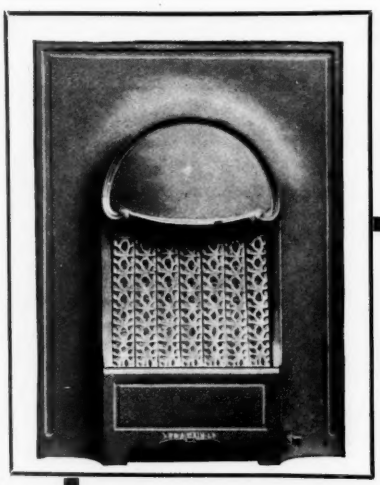
The make of gas averaged 10,525 cubic feet per ton of coal; and the coke consumed as fuel in heating the settings amounted to 16·235 per cent. by weight of the coal carbonized. The coal carbonized consisted of 77·67 per cent. of Westphalian, and the remainder of English coal. After paying interest and depreciation charges, the working for the year resulted in £150,000 being available for the relief of rates, and £4064 being placed to the reserve fund.

OLDHAM GAS WORKERS' WAGES.

Veiled Threat of a Strike.

The agitation on the part of several grades of workmen employed at the Oldham Gas-Works for increased pay and a week's holiday each year with full wages has been revived; and in a letter received by Mr. Arthur Andrew, the General Manager of the Gas Department, from Mr. J. R. Clynes, M.P., Secretary to the Gas Workers' and General Labourers' Union, there is a suggestion that the men will cease work unless some concessions are granted. It is nearly six months since the matter first came before the Gas Committee; the advances asked for being 5d. per shift for the shiftmen, ½d. per hour additional for all yardmen and other labourers employed on the gas-works premises, 2s. a week extra to meter inspectors, and for all classes of workmen one week's holiday a year with pay; double pay to be allowed in all cases where this is not now given for work on Christmas Day and Good Friday, and single pay when not working. The Gas Committee, after much consideration, and with returns before them from other towns, could not see their way to entertain the demands made by the men; adding that, as the application of the labourers affected several other departments of the Corporation, it should be dealt with collectively by all the Committees concerned.

Mr. Clynes has written to the Gas Committee stating that their decision has aroused much discontent among the members of his Association; and he wishes to know whether the subject of labourers' pay and holiday privileges has been brought to the notice of the other Committees. He adds: "Apart from whether the matter has been dealt with on these lines, I have to state that the men cannot accept the decision of your Committee; and our contention is that a case has been submitted which justifies our present claim to your further attention. We submit that during the interview with your Committee on the 7th of August it was proved clearly that the Oldham men are paid



In many types of fuel now upon the market structural strength has been sacrificed for the sake of obtaining instantaneous (more or less) incandescence. The result is extreme fragility, constant breakages, and heavy expense in maintenance.

FIRES FOR HIRE.

The new improved fuel in our "D.S.O." Fires, while of a brilliant appearance, is strong—in fact it is the strongest on the market. It does not require to be manœuvred into position, as there are no obstructions to be avoided, and is therefore not likely to be broken when fitting. As it leans back against the brick, it will not fall out in front.

MAIN MEANS MINIMUM MAINTENANCE.

R. & A. MAIN, LIMITED,

WORKS: Gothic Works, EDMONTON, N.; Gothic Ironworks, FALKIRK; and Gothic Works, BIRMINGHAM.
SHOW-ROOMS AND BRANCHES: 25, Princes Street, Oxford Circus, W.; 136, Renfield Street, GLASGOW; 56, Broad Street, BIRMINGHAM; 83, Old Market Street, BRISTOL; 13, Whitworth Street West, MANCHESTER; 8, Exchange Place, Donegall Street, BELFAST; 333, Queen Street, MELBOURNE; and 12, Cunningham Lane, Pitt Street, SYDNEY, N.S.W.

at rates below those of other places; and it was admitted that the men were working to their utmost capacity. It is fourteen years since the labourers received any advance, and more than four years since the other men obtained any concessions. The concession four years ago to most of those who received it was 1d. per shift; while any substantial advance applied to less than a score of the well-paid workmen. In view of these facts and the case for advances of wages recently recognized throughout the country, I have to say that the Oldham men have decided that they cannot continue work under present conditions, and have instructed me to ask whether you can give some more favourable decision not later than Thursday, Oct. 17."

In the course of his reply, Mr. Andrew explains that a meeting of the Committees employing the same class of labour has been arranged for the 16th, when the whole question of wages and holiday privileges will be considered. The other matters, he says, will be laid before the Gas Committee at their next meeting.

CO-PARTNERSHIP AT CROYDON.

The report of the Co-Partnership Committee of the Croydon Gas Company for the year ended the 30th of June has been issued. It is signed by the Chairman of the Company and of the Committee (Mr. Charles Hussey, J.P.), and is accompanied by an abstract of the accounts made up to the above-named period, signed by the Secretary and Trustee (Mr. William W. Topley). The report shows that since the inception of the co-partnership scheme 670 agreements have been entered into, and 116 have terminated, mainly through men leaving the Company's service. The number of agreements now in force is 554. During the year, £1853 was invested by co-partners, through the scheme, in stock of the Company—making a total of £3785 to date. The bonus for the year was at the average rate of 5¾ per cent.—5 per cent. for the remainder. Attention is called to the fact that, notwithstanding the expense caused by the coal strike and transport difficulties, the results of the Company's operations during the year were very gratifying. The Committee express their pleasure at learning that the increase in sales of gas for the quarter just ended has been even more satisfactory than that in the preceding year. They congratulated the co-partners that from the inception of the scheme to the 30th of June there has been withdrawn only the sum of £1190 out of a total amount of £5112 which could have been taken out, or less than 24 per cent.; also that there is to be shortly transferred to co-partners, at their expressed wish, £1105 of "D" stock of the Company, in addition to the £965 which will be automatically transferred. The Committee regard it as very satisfactory that the savings to date amount to nearly one-half the total credit as bonus. The savings so effected at the present time by 46 co-partners are at the rate of £367 8s. per annum; and the Committee consider these figures might well be increased both in number and amount.

MANCHESTER CORPORATION GAS SUPPLY.

Discount System Recommended.

A Special Sub-Committee of the Manchester Corporation Gas Committee who have for some time been considering the question of the price of gas and how best to develop its consumption for heating and power purposes, have concluded their labours, and the details of a scheme which has been agreed to by a majority will be made known this week. It is understood that no direct reduction in price is recommended; but by a discount system consumers, especially the larger ones, will benefit by the prompt payment of accounts. It is stated, in fact, that some of the very large users of gas within the area of supply will obtain, under the new scheme, a reduction equal to 6d. per 1000 cubic feet—bringing the charge down to 1s. 6d. It is not proposed to make any concession to the consumers using prepayment meters, mainly on the ground that quite recently the quantity of gas supplied for 1d. was increased from 30 to 33 cubic feet for residents within the city boundaries, and from 25 to 28 cubic feet for consumers outside, which meant a loss of income to the Gas Department of about £8300 per annum. There are upwards of 66,000 slot-meter users on the list; and it is certain that the Labour members in the Council will have something to say about their not getting any concession under the scheme. At 33 cubic feet for 1d., the price works out at 2s. 6d. per 1000 cubic feet, compared with 2s. 3d. now paid by the ordinary consumer. In June last year, the price charged for gas used within the city for manufacturing purposes only was reduced from 2s. 3d. to 2s., provided that the annual consumption was not less than 500,000 cubic feet.

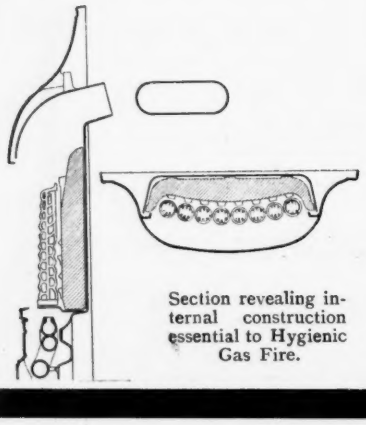
DIFFERENTIAL GAS CHARGES AT BURY.

Local Government Board Inquiry.

The proposal of the Bury Corporation for the abolition of the special rating districts of Elton, Tottington, Walmersley, and Pilkington, and the inclusion of such districts in the borough for all purposes, was the subject of a Local Government Board inquiry at Bury last week; the Inspector being Mr. R. C. Maxwell. Mr. J. Haslam, the Town Clerk, in the course of his general statement, pointed out that the gas consumers in the "added areas," as they were called, would benefit considerably by being included, for they would then get their supply at the same charge as that made to consumers within the borough. At present, residents in the added areas had to pay 9d. per 1000 cubic feet more for their gas than consumers in Bury itself. Evidence given in support of the scheme by Alderman T. S. Collinge and Alderman W. Dawson showed that the differential charges for gas were the cause of considerable friction. In some streets, residents on one side would have to pay more for gas than those on the opposite side; and this, the

HYGIENIC

DAVIS'S Shadowgraph test has demonstrated that every fire of the "New Barless" Series is absolutely healthful. It is practically a doctor's certificate. This is what the general public have all along been looking for—a definite guarantee that the gas fire they are asked to use is absolutely above suspicion.



Section revealing internal construction essential to Hygienic Gas Fire.

THE DAVIS GAS STOVE CO., LTD.

Telephone: 742 BANK.

Alderman declared, gave rise to trouble. In fact, there was a difficulty on this account in letting these houses. There was no opposition to the scheme. According to the Corporation "Year Book," the net price of gas for the past financial year in the borough was 1s. 11d. per 1000 cubic feet for lighting and heating, and from 1s. 9d. to 1s. 5d. for power purposes. The net profit on the undertaking for the twelve months was £9757, of which £4366 was handed over in relief of rates; a similar sum being applied to a reduction in gas charges, and the balance going to the reserve fund.

GAS CHARGES AT ROCHDALE.

No Reduction Possible.

After a full consideration of the position, and having before them returns from about thirty towns in Lancashire and adjoining counties, the Rochdale Gas Committee have decided that it would not be wise, at the present juncture, to recommend the Town Council to make any alterations in the charges for gas, as suggested by the local Trades Council. The chief reason given for this decision is the enhanced price of coal and other articles required at the gas-works. The rise in the price of coal averages about 2s. per ton compared with last year, which, on the 55,000 tons already contracted for, represents an additional charge on the department of £6000, and the full supply for the twelve months has not yet been arranged for. Thirteen months ago, reductions of 2d. per 1000 cubic feet to ordinary consumers, and of 3d. per 1000 cubic feet to slot-meter users, were made; and supporters of the movement for cheaper gas point out that, in spite of these reductions, the Gas Department made during the year ended March last a profit of £20,306—the largest in the history of the undertaking. Of this profit the Council took for rate relief £16,000, which is equal to the proceeds of rather more than a rate of 10½d. in the pound. It was also suggested by the deputation from the Trades Council who waited upon the Gas Committee that cooking-stoves should be supplied and fixed free. Replying to this, the Gas Committee state that as there is now a reduced charge for gas used for cooking and heating purposes they do not feel in a position to make any concession on these points. The receipts from the hire of gas-stoves at present amount to between £700 and £800; but the Committee say that when the cost of maintenance and repairs is deducted the surplus on this branch of the undertaking is very small. At present the charge for gas for lighting purposes in Rochdale is 2s. 6d. per 1000 cubic feet, with the usual discount. For other purposes than lighting, the prices are 2s. up to 10,000 cubic feet consumption, 1s. 9d. up to 100,000 cubic feet, and 1s. 6d. beyond this.

The Directors of the Monte Video Gas Gompany, Limited, have declared an interim dividend of 6s. per share, less tax, for the half year ended the 30th of June.

SWINTON AND MEXBOROUGH GAS-WORKS PURCHASE.

A Costly Business.

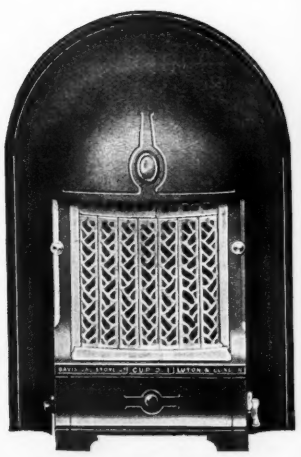
In the course of the proceedings at the Local Government Board inquiry recently held at Swinton in regard to an application made by the Swinton and Mexborough Gas Board for sanction to the borrowing of £20,000 for the extension and improvement of their works [see *ante*, p. 131], the Clerk to the Board (Mr. J. W. Hattersley) gave the Inspector some particulars in regard to the cost of transfer of the undertaking. Having fully explained the circumstances which resulted in the question of price being referred to arbitration—the Board's offer of £40,000 having been declined—Mr. Hattersley stated that the award amounted to £60,370; and the Board had also to pay the costs of promoting the Gas Company's Act of 1908, which were £2246 16s. 5d.; compensation to officials, which was very favourably settled for £1000; and the valuation for stock-in-trade as on the date when the works were taken over, amounting to £268 10s. 6d. The sum paid to the Company was £63,855 6s. 11d., in addition to which the Board had to pay the Company's taxed costs of the arbitration, and their reasonable costs of winding-up the concern. The costs in the arbitration had been taxed at £1367 9s. 6d.; but those connected with the winding-up had not been taxed. To cover these he had allowed £150. On this basis, the total sum paid to the Company would be about £65,134. The £268 10s. 6d. paid for stock, &c., should not really be included in the cost of the concern, as it represented coal and materials usable by the Board. This would reduce the sum paid for the undertaking as such to less than £65,000. The Board's own costs in the arbitration, so far as they had been ascertained, were as follows: Umpire and Arbitrators, £610 8s. 6d.; witnesses, £960 17s. 3d.; half cost of shorthand notes and printing minutes of arbitration proceedings, £224 1s. 6d.; sundries, £17 13s.—making a total of £1822 0s. 3d. In addition, there were the costs of the Parliamentary Agents, Counsel's fees, and his own costs, all of which had yet to be taxed, and which he estimated altogether at £1200. Then they had had to pay £606 10s. for stamp duty on the King's Printers' copy of the Act of Parliament. To this should be added the £400 paid to the Mexborough Council towards the cost of the opposition and the costs of promoting the Board's own Act, which were taxed at £1703 1s. 3d. It might, therefore, be taken that the total cost of the concern would be under £71,000.

An interesting display of the power of the natural gas supply at Lethbridge (Alberta) was given to the Duke of Connaught and his party on the occasion of their visit. This gas is supplied to the inhabitants at the charge of 15 c. per 1000 cubic feet. It was arranged to burn 2,000,000 cubic feet before the Royal party; and for the purpose a 6-inch pipe was utilized, in an open space in the middle of the city. The escaping gas was ignited by means of a rocket; and it is said that the flame shot up to a height of 100 feet.

GAS FIRES.

"New Barless" Fires give well over 50 per cent. Radiant Efficiency, and they are constructed to do their work with the strictest ECONOMY.

In recommending them to your consumers you are breaking down every prejudice which has hitherto existed against Gas for Heating Purposes.



Davis's "Cupid" Fire.

One of a big series of Hygienic Gas Fires.

(Sales Dept. and London Show-Rooms) **59, Queen Victoria St., London, E.C.**

Telegrams: "DEGASCO CENT LONDON."

BENZOL v. PETROL FOR DRIVING MOTOR-CARS.

Suggested Supply from Gas-Works.

Under the heading of "Gas-Works and Home-Made Fuel," in a recent number of "The Autocar," a correspondent stated that the Mitchell Main Colliery Company, Limited, had for the past four years been running five or six different classes of cars on benzol of their own manufacture, with good results. The writer said no doubt benzol would become very generally used if the question of distribution did not stand in the way. He asked: "Could not local authorities who own gas-works, and use benzol for their own purposes, be prevailed upon to help their ratepayers who are users of motor spirit to obtain supplies at a reasonable price, and thus help to meet the present 'squeeze' in the price of petrol?" The letter was accompanied by a circular which the Editor of the above-named publication thought of sufficient general interest to reproduce; and in doing so he expressed the hope that his readers would avail themselves of the valuable hint given in the letter and take up the matter with their local gas-works managers, as no doubt if they did so arrangements would in many cases be made which would be mutually satisfactory.

In the course of the circular, it was stated that the Colliery Company had used a specially prepared and refined spirit, called Mitchell's motor spirit, on certain specified cars, with the following results: On a 28 to 36 H.P. Daimler, on a test of 150 miles, 26·4 miles per gallon; on a 20 H.P. "Ariel," on 186 miles, 26·3 miles per gallon; on a six-cylinder "Napier," on 172 miles, 20·2 miles per gallon.

Commenting on the matter, the Editor said: "From a letter which we publish in our 'Correspondence' columns, it will be seen that a very practical suggestion is made by a firm of colliery proprietors with regard to the use of benzol. We need hardly say that refined benzol is produced from coal; and it is perfectly suitable for using in place of petrol, so long as sufficient air is mixed with it. It requires a greater proportion of air than petrol; but that is all. The difficulty with regard to it is that only those living near the centres of manufacture can obtain it with ease; and the suggestion of our correspondents is that the local authorities who own gas-works, and who use benzol for clearing naphtha and naphthalene out of their mains or for increasing the illuminating power of their gas, should supply residents—*i.e.*, their ratepayers—with benzol at a reasonable price, and thus help to place them independent of the more expensive foreign fuel. It would simply mean that the local gas-works would order a little more benzol than they now do, and then there would always be sufficient for the requirements of the resident motorists. We must say that we regard the suggestion as an extremely practical one, because it overcomes the one great difficulty—viz., the question of distribution, as it would be perfectly easy for the motorist living near gas-works to send his tins to be filled periodically. And, no doubt, if a regular demand were created, it would pay the gas-works as well as be a convenience to the motorist. Last, but not least, it would assist in supporting home industries. As many of our readers are members of city and town councils, or are in other ways directly or indirectly connected with gas-works, we hope that they will bring the matter before the managers, and see if something cannot be done. It is also desirable that each individual motorist who is interested in the matter should take it up with the manager of his local gas-works, to see if he cannot make some arrangement with him for obtaining benzol in the way we have suggested. It follows that the more inquiries each gas-works receives, the more likely are the officials to adopt the suggestion, and to arrange for local motorists to be supplied from their bulk stock of benzol."

GAS AND METER TESTING IN EDINBURGH.

Annual Report of the Official Inspector.

We have received from the Chief Inspector of the Gas and Gas-Meter Testing Department of the City of Edinburgh (Mr. William Gordon) his seventh annual report, containing an account of the work of the department in the twelve months ended the 15th of May last. It furnishes the following particulars.

The number of meters tested was 98,118, of which 15,004 were wet and 83,114 dry; and fees to the amount of £2717 14s. were collected. Compared with the year ended May 15, 1911, these figures show an increase of 7871 meters and £245 14s. in fees. Mr. Gordon says: "The large number of meters tested and examined may be attributed to the increased requirements of gas consumers throughout the country, as an impetus has been given to the gas industry owing to the progressive policy of a number of companies and local authorities in supplying and fitting-up cookers, fires, and other gas appliances, free of charge or for quite a nominal sum per year." The 98,118 meters tested and examined in the period covered by the report were made up as follows: New prepayment meters, 42,937; prepayment meters repaired, 11,363; new ordinary meters, 33,972; ordinary meters repaired, 9680; ordinary meters tested "for certificate," 166. Of the dry meters 741, and of the wets 49, were rejected as incorrect. The number of meters tested by the department since its institution in 1861, up to and including the 15th of May last, is 2,618,036; the fees received for the same period being £76,506 2s. The cash statement appended to the report shows that the expenses in the past year amounted to £1541; leaving a profit of £1176, which is stated to be the highest since the institution of the department.

In the course of the year, 301 tests of the illuminating power of the gas were carried out, under the conditions prescribed by the Metropolitan Gas Referees. The average was 16·71 candles, compared with 14 candles, measured by a No. 2 "Metropolitan" test-burner, fixed by Statute. Included in the report are photographs of the Government standard models, as erected in the City Chambers, and of the cubic foot bottle used to verify the working gasholders (twenty in number), which were found to be correct.

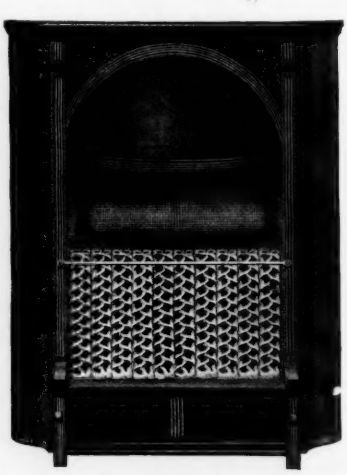
ARDEN HILL'S "LOKA" GAS-FIRE.

THIS NEW SHELF-TOPPED FIRE, with the "OLAK" (Round-topped) and the "KALO" (Square-topped), completes a triad of popular Stoves—The "O.K." Series.

Fitted with the new **"Helium"** Radiants (Regd. Design) which give pure and perfect Radiant heat—warming the room without drying the air.

Great heat for little gas - -

EFFICIENCY.



Little gas for great heat -

ECONOMY.

These Fires are supplied in Best Black, Armour Bright, Porcelain Enamel, and Copper Finishes.

The "LOKA."

Send for Price Lists:
ARDEN HILL & CO.,
ACME WORKS,
BIRMINGHAM.

MICROSCOPIC GROWTHS IN LEEDS WATER-MAINS.

According to a statement made to a representative of the "Yorkshire Evening Post" by Mr. Thomas Winn, a member of the Water Committee of the Leeds Corporation, a tiny microscopic vegetable growth which accumulates in the water-mains is costing the city some thousands of pounds a year, and is expected to entail a much larger expenditure before it can be got rid of.

Mr. Winn, in the course of his remarks (as reported last Friday week), said: "From our gathering-grounds, which are ideal, except for the existence of this pest, we have four pipe-lines, 40 miles long and 30 inches diameter, each of which costs about £90,000 to lay; and these are being absolutely ruined by this growth. Our attention was first drawn to it when we endeavoured to find the cause of the many complaints of low water pressure which came from certain parts of the city. Experts made examinations, and they told us the cause of the trouble. It seems that on our gathering-grounds this minute vegetable growth flourishes. It gets into the pipes and clings to the inside with extraordinary pertinacity. Then when the water gets to the filter-beds at Headingley, the processes to which it is subjected there fail entirely to eliminate the growth, with the result that it gets into the smaller mains of the city and continues its career of destruction. No matter at what rate the water travels through the pipes, this terrible little pest manages to cling and accumulate. In the course of from five to ten years we have found that in the larger pipes the incrustation has proceeded to such an extent that the carrying capacity of the pipes has been reduced by more than 40 per cent., and some of the 4-inch mains of the city have become so closed up that you could not get your finger into them."

The result of all this was, said Mr. Winn, that when there was a special demand for water, it was simply impossible to get it through the mains quickly enough. Indeed, in order to meet the demand, the Corporation were having to lay down another 30-inch main. Before they do this, however, they are determined that the large amount they will spend will not be devoured by this devastating growth. They have tried many methods, but so far none has been successful. The skin of the pipe has been made of materials to which it was thought the growth might possibly have an aversion, and the mains have been lined with pitch. But all to no purpose. When the growth has accumulated, it sets as hard as iron, and it can hardly be broken with a sledge-hammer. To remove it temporarily, the Corporation have been spending £2000 to £3000 a year in clearing the pipes with a mechanical screw cleaner. But even then it is difficult work; and the lining of the pipe, of course, is absolutely ruined.

In order to see what other towns, troubled in the same way, have done, several deputations of the Water Committee have been making investigations in different parts of the country; and a report on the subject is being prepared. On these deputations, Mr. Winn has been one of the most strenuous workers.

WATER CONSERVATION IN NEW YORK STATE.

A Comprehensive Scheme.

An example of the development of natural resources for the public benefit is given in plans presented by the Division of Inland Waters of the Conservation Commission of New York. We learn from "Engineering Record" that this body has been conducting surveys and making plans for a water supply system to serve practically all the cities and villages between Rochester and Buffalo, furnishing an abundant supply of pure water under ample pressure.

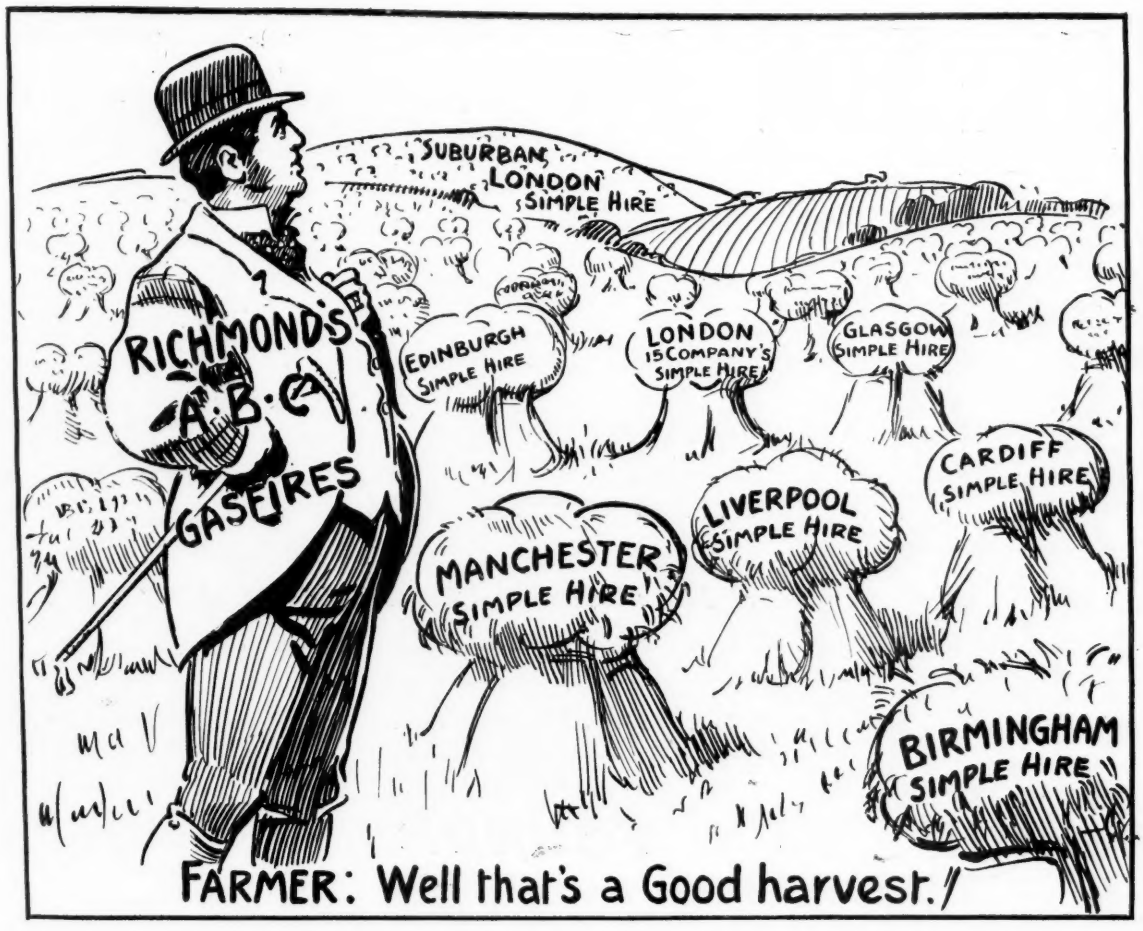
To accomplish this, it is proposed to build a reservoir dam, about 80 feet high and with a top length of 800 feet in Linden, on the Little Tonawanda Creek. The area of the reservoir will be about 1000 acres; and it will have a storage capacity of about 10,000 million gallons. The watershed immediately adjacent to the reservoir will be 22 square miles; while it will be possible to bring in from other sources the water from at least 53 square miles of additional watershed, thereby making a total available area of 75 square miles. At an annual run-off of 22 inches from the 22 square miles, 4500 million gallons of water will be gathered, which will equal a supply of 100 gallons per head per diem for 125,000 inhabitants. The 12-inch run-off is a minimum, and probably far below the actual, assumption.

A stream-gauging station has been located on the creek at the dam site at Linden, and two rain-gauge stations have been established for the purpose of acquiring rainfall and stream-flow data. The elevation of the flow line of the Linden reservoir will be 1150 feet above the tide. Among the places proposed to be supplied, Batavia is the highest, being 900 feet above tide, so that the heads throughout the distribution territory will be from 200 to (possibly) 600 feet, and will have to be reduced where necessary.

The total estimated population of the district involved is about 165,000; being 85,000 in cities and villages and 80,000 on farms. It is expected that water from the Linden reservoir can be supplied to all the urban population and to at least half of the rural population. At present 77,000 of the above population are supplied with water of poor quality and insufficient in quantity. It is also expected that water can be supplied to at least 48,000 people who are now without any supply, and most of whom could not, on account of the expense, be served by small, separate water-works.

The general idea is that water will be sold from this system to the municipalities or water districts; and the distribution and sale would be under their control. It is estimated that the cost delivered at standpipes will not exceed $30 (£6 5s) per million gallons.

Before any construction can be done, additional legislation will be necessary. The Conservation Commission expect to present to the next State Legislature recommendations for proposed measures on the subject.



Advertisement of THE RICHMOND GAS STOVE & METER CO., LTD., WARRINGTON & LONDON.

NOTES FROM SCOTLAND.

From Our Own Correspondents.

Saturday.

Banff.—Among the registrations of joint-stock companies in Edinburgh this week is the Banff Gas Company. The capital is £5100, in shares of £17 each. The object of the formation of the concern is to secure and carry on the business of the Banff Gaslight Company.

Dunbar.—The gas workers' wages, which are at present 27s. weekly, are to be raised 1s. 4d. per week.

Dysart.—The new gasholder erected for the Dysart Gaslight Company was formally opened last Saturday by ex-Provost Harrow. The holder has a capacity of 55,000 cubic feet.

Grangemouth.—To consider a recommendation regarding the price of gas, a statutory meeting of the Town Council, presided over by Provost Main, was held on Monday evening. There was submitted a minute of the Gas Committee dealing with the revenue derived from slot meters, as follows: Price of gas sold by slot meters, amounting to 7,500,000 cubic feet, at 3s. 9d., £1406 5s.; at the ordinary meter rate of 2s. 11d., £1093 15s.; difference, £312 10s. The expenses incurred in collecting from slot meters, &c, amounted to £174; making an apparent additional profit of £138 10s. The Convener explained that, having considered the figures, he had come to the conclusion that a reduction of 3d. per 1000 cubic feet could be given, which was equivalent to a reduction of 7½ per cent., or one cubic foot extra for a penny. After consideration, it was agreed to approve of the suggestion, and to recommend that the price of gas for the current financial year should be for ordinary meters 2s. 11d. per 1000 cubic feet, and for slot meters 3s. 6d. After a brief discussion, the minute was adopted.

Hamilton.—At the monthly meeting of the Hamilton Town Council, held on Tuesday—Provost Smellie presiding—the Gas Committee's report was submitted. After a prolonged discussion as to free piping, Bailie Moffat moved the adoption of the report; while Councillor Anderson moved an amendment that the petitions from the Burnbank district for the free piping of houses should not be entertained. On a division, the amendment was lost by 11 votes to 2.

Kilmarnock.—The monthly meeting of the Town Council was held on Wednesday evening—Provost Matthew Smith presiding. A minute of the Gas Committee contained a recommendation of the Sub-Committee appointed to consider the question of the hiring of gas-fires, radiators, &c., in view of the changed conditions under the House Letting Act. The recommendation was as follows: "(*a*) That all Berlin-blacked gas-fires, formerly hired-out by the Gas Department, be still hired-out as before. (*b*) That, in view of the trouble and expense following the hiring of porcelain enamelled gas-fires in exceptional colours, the Gas Department hire these fires in two popular colours only—dark green and teapot brown—all porcelain enamelled fires outside of these two colours to be purchased by the consumer. (*c*) That, taking into consideration the new state of things that has followed the short-letting system, consumers requiring gas-fires, &c., should sign the regulations for a year's hire, the amount to be paid in advance, and within that time any change requiring to be made to suit the convenience of the consumer must be paid for by him; the Gas Department declining to move his heating appliance within that time at their own cost. The same conditions, so far as the removal of appliance to suit consumers is concerned, to hold with all gas-cooking appliances as well as with gas-heating appliances."

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Oct.* 12.

Sulphate of Ammonia.

Owing to the lack of support from middlemen and the paucity of new business from direct buyers, the market for this material has again assumed a drooping tendency during the past week. Prices have not, however, receded to any great extent, and the nearest values at the close are £14 3s. 9d. per ton f.o.b. Hull, £14 5s. per ton f.o.b. Liverpool, and £14 6s. 3d. per ton f.o.b. Leith, though it is reported that there are second-hand sellers at less money. There is no change in the attitude of either manufacturers or dealers as regards future delivery; the former still holding for a substantial premium on prompt prices, and the latter being content with a very moderate one.

Nitrate of Soda.

This market continues quite steady, and the spot quotations are repeated at 11s. 6d. per cwt. for ordinary quality, and 11s. 7½d. for refined.

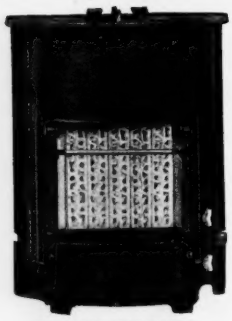
LONDON, *Oct.* 14.

Tar Products.

Business in tar products has been rather quiet during the past week; and one or two articles are written at lower prices. Sales of pitch are reported at lower figures; and buyers are now holding-off the market, anticipatiag further reductions. Benzoles remain fairly steady, though sales are reported for the forward position at slightly lower values. In solvent naphtha, though there is practically no alteration in the price, there appears to be more stuff offering for this year's delivery. Heavy naphtha is in good demand. Creosote continues firm; and the inquiries are numerous. In crude carbolic there is still no business doing.

The average values during the week were: Tar, 28s. 6d. to 32s. 6d. Pitch, London, 46s. 6d. to 47s.; east coast, 46s. 6d. to 47s.; west coast, Clyde, 47s. 6d to 48s. 6d.; Manchester, 46s. to 46s. 6d.; Liverpool, 46s. to 46s. 6d. Benzol, 90 per cent., naked, London, 1s.; North 11½d.; 50-90 per cent., naked, London, 11½d.; North, 11d. Toluol, naked, London, 11½d. to 1s. 0½d.; North, 11¼d. to 11⅜d. Crude naphtha, in bulk, London, 5½d. to 5¾d.; North, 5d. to 5¼d. Solvent naphtha, naked, London and North, 1s. 1½d. to 1s 2d. f.o.b. Heavy naphtha, naked, London, 11½d. to 1s. f.o.b.; North, 10d. to 11d. f.o.b.

"CANNON" Latest GAS FIRES.



The "PRIMROSE."
6 in. Fire. List Price **21**/-

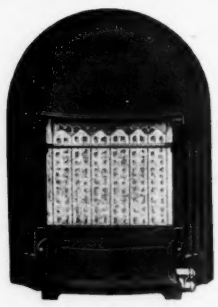
SPECIAL FEATURES:—

INTERCHANGEABLE PARTS.

REVERSIBLE GAS CONNECTION.

ARTISTIC DESIGNS.

SCIENTIFIC CONSTRUCTION.



The "VIOLET."
6 and 8 in. Fires.
Prices from **15**/-

Our Speciality "Vitrolustre" Colour Enamelled Fires with LEADLESS GLAZE.
RICHNESS OF COLOUR AND PERMANENCY.

WRITE FOR A SUPPLY OF OUR NEW SEASON'S LISTS, FREE ON APPLICATION.

Manufacturers:—

CANNON IRON FOUNDRIES, LIMITED,

DEEPFIELDS, near BILSTON, Staffs.

London Office and Show-Rooms: 18, HOLBORN VIADUCT, E.C.

Australasian Agents: MOLDEN & BUDDEN PTY., Ltd., 364A, Little Collins Street, MELBOURNE, Vic., and at SYDNEY, N.S.W.

Creosote, in bulk, London, from 3⅛d. to 3¼d.; North, 3d. to 3¼d. Heavy oils, in bulk, 3⅜d. to 3½d. Carbolic acid, casks included, 60 per cent., east coast, 1s. 11d. to 2s.; west coast, 1s. 10½d. to 1s. 11d. Naphthalene, £5 to £9; salts, 45s. to 55s., bags included. Anthracene, "A" quality, 1½d. to 1⅝d. per unit, packages included and delivered.

Sulphate of Ammonia.

Business has been exceedingly quiet in this article. The large buyers still appear to be holding from the market, which is certainly having some effect on the price. Actual Beckton is quoted at £14. Outside London makes are £13 10s. to £13 12s. 6d.; Hull, £13 3s. 9d. to £13 5s.; Liverpool, £14 5s. to £14 6s. 3d.; Leith, £14 6s. 3d. to £14 7s. 6d.; Middlesbrough, £14 3s. 9d. to £14 5s.

COAL TRADE REPORTS.

Northern Coal Trade.

There is a stronger inquiry for coals, especially for Durham kinds, and the prices seem to be firm. Best Northumbrian steams are from 13s. to 13s. 3d. per ton f.o.b., second-class steams at 11s. 9d. to 12s. 3d., and steam smalls from 9s. to 10s. 3d. The production at the collieries is good, and it is well taken up, though there is a little doubt how far the war outbreak may affect a part of the shipments. In the gas coal trade, the demand shows the increase that is usual as the nights lengthen appreciably, and the price is rather higher. Best Durham gas coals are from 13s. 4½d. to 13s. 6d. per ton f.o.b., second-class gas coals are about 12s. 9d. to 13s., and for "Wear specials" up to 14s. is quoted. As to contracts, the Berlin sales have resulted in a large quantity of Silesian coal having been taken—perhaps above one-half of the total; while Durham coals have also been contracted for at a price about 11s. 3d. to 11s. 7d. per ton f.o.b., but the allowance for freight affects the prices. Coke is very firm. Though there is a larger production of gas coke, the price is higher—good gas coke being now from 21s. 6d. to 22s. per ton f.o.b.

Scotch Coal Trade.

In the West of Scotland, there is no activity in the coal trade; but business is brisk throughout the Lothians and Fife coalfields. The following were the prices ruling approximately in Glasgow on Friday, f.o.b.: Steam coal, 11s. 6d. to 12s. per ton; splint, 13s. 6d. to 14s.; ell, 11s. 9d. to 12s. 3d.; trebles, 13s. to 13s. 6d.; doubles, 12s. 6d. to 13s.; singles, 12s. to 12s. 6d.

Salford Corporation Gas-Works Extension.—In accordance with the resolution passed by the Salford Town Council at their September meeting, the Gas Committee have requested Mr. Corbet Woodall and Mr. E. H. Stevenson to report whether the land which it is proposed to purchase from the Earl of Ellesmere is the most suitable plot available for the proposed extension of the gas-works as laid before the Council on the 4th ult., as reported in the "JOURNAL" for Sept. 10.

Derwent Valley Water Arbitration.

The hearing of an arbitration case between the Derwent Valley Water Board and the Corporations of Sheffield, Derby, Nottingham, and Leicester was begun and concluded last week in London. Mr. Charles A. Russell, K.C., officiated as Arbitrator; and the proceedings consisted of addresses by Counsel appearing on behalf of the various authorities concerned. The point to be decided was the apportionment of costs of the Water Board under the Act of 1899 and succeeding Acts. The arguments extended over three days; and at their conclusion, the question agreed upon to be left to the Arbitrator (who reserved his award) was as follows: "Upon what principle and which of the expenditure incurred by the Board to Dec. 31, 1911, ought to be borne by the four Corporations in the ratio of their statutory proportions." It was argued on behalf of Sheffield that, in consequence of a resolution passed by the Board, the Corporation were put in a serious position compared with the other authorities, and had had laid upon them expenditure which should be borne by all the others. A report of what transpired at the hearing will appear in an early issue of the "JOURNAL."

New Issue of Gas and Water Capital.

Messrs. A. & W. Richards resumed last Tuesday their sales of gas and water stocks and shares at the Mart, Tokenhouse Yard, E.C. The first lots offered consisted of some new ordinary £10 shares in the Southend Water Company, ranking for a maximum dividend of 5 per cent., but entitled to 4½ per cent. They were sold at par. The next lots were £6000 of ordinary "D" stock of the Broadstairs Gas Company, ranking for a standard dividend of 7 per cent. per annum, subject to the sliding-scale, equally with the Company's existing similar stock, which at present carries dividend at this rate. As, however, the dividends have been paid free of income-tax, at the existing rate the distribution is equivalent to about £7 8s. 6d. per cent. per annum, less tax. The whole of the stock was sold at from £123 to £126 per £100. An issue of £2000 of 4 per cent. perpetual debenture stock of the same Company fetched from £90 to £93 10s. per £100. Next came a small issue of new ordinary £10 water shares in the Dunstable Gas and Water Company, ranking for a maximum dividend of 7 per cent., but entitled to the rate paid on the original shares—viz., 6¾ per cent. They realized from £12 15s. to £13 apiece. The final lots consisted of an issue of £10 "B" shares and £2000 of 4 per cent. perpetual debenture stock of the Tendring Hundred Water Company. The shares were 8 per cent., but the rate for the last six years has been 4½ per cent., and they realized £11 to £11 2s. 6d. each. The debenture stock was all sold at par.

Messrs. John Wright and Co. have recently received an order for thirty of their 425 "Eureka" gas-cookers, which are to be installed in the West Derby Hospital, Liverpool. This, they say, is probably one of the largest orders given for cookers for one institution.

The Flueless Heater.

The careful and varied Analytical Tests carried out by Dr. R. Lessing, Ph.D., F.C.S., London, proves

Clark's Patent Hygienic Syphon Stoves

to be the ideal Heaters for places where no flue outlet is provided.

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PURE HEAT

THE ONLY HYGIENIC HEATER WHICH DISPENSES WITH FLUE :: :: OUTLET :: ::

Truro Gas Company's Proposed Electric Lighting Powers.

A report was presented to the Truro Town Council last Tuesday of an interview which had taken place between the General Purposes Committee and Messrs. John James and W. Bryant, Directors, and Mr. S. J. Ingram, Manager of the Gas Company, with reference to the application of the Company for a Provisional Order for the supply of electric light. The representatives of the Company pointed out the advantages it possessed over an outside company in regard to the erection of buildings, and stated that the Company were willing to have inserted in the Order clauses for the protection of the rights of the city. They were also prepared to have inserted in the Order a clause enabling the Corporation to purchase the undertaking, but it would be necessary for the clause to apply to the gas as well as to the electricity portion of the undertaking. The Corporation have already powers for the purchase of the gas portion, but the period within which these may be exercised expires next year. It is therefore proposed to extend it by the Provisional Order. It is intended to include the municipal borough within the area in which electricity may be supplied, but to define a limit within which the Company shall be under the necessity of laying cables in two years. The suggested standard charge for electricity is to be 8d. per unit, which it was explained is equal to 6s. per 1000 cubic feet of gas. To protect the Company from loss on laying unremunerative services, it is proposed to charge each person taking a supply 20 units per quarter. Cables are to be laid underground in the compulsory area, and those beyond it as the Company and the Corporation may agree. The report was adopted.

Sale of Shares.—Recently 32 shares in the Windsor Royal Gaslight Company were sold by Messrs. Buckland and Sons. Four new £20 shares (£8 paid), bearing interest at £7 per cent. per annum, realized £11 15s. each; while the remainder were original shares of £20 each (fully paid), bearing interest at 10 per cent. per annum, which realized from £43 10s. to £44 each.

Electric Light Failures.—The electric light suddenly failed in Cardiff last Friday evening, causing considerable inconvenience in the streets and in those shops which depend upon this method of illumination. Fortunately, however, the cessation of the current was not very prolonged. The same evening, Highbury suffered from a temporary failure of the Islington Borough Council's electricity supply.

An Adventure in a Well.—When engaged in examining a well at the Tilehurst Water-Works, Reading, Mr. George Lothian (Consulting Engineer) stood on a wooden support 80 feet below the ground surface. The support collapsed, and Mr. Lothian fell a distance of 30 feet into the water, breaking his ankle. Thomas Aitken, a foreman who had gone down with Mr. Lothian, managed to grip a ladder at the side of the well; and by the aid of a match (the lamps having been extinguished), he found the Engineer, and at considerable risk managed to haul him up to a narrow ledge, subsequently climbing to the surface for assistance.

Exmouth Water-Works.—A report presented to the Exmouth District Council last Wednesday week recommended that application be made for a loan of £1200 for the extension of the water-mains. It was stated that a loan of £500 three years ago had been exhausted, and that during these three years there had been an increase in the water revenue of £445 per annum. Mr. Beavis contended that this increase in the revenue was not due only to the extension of the mains, but arose in part from the growth in the rateable value of the town. Mr. Perry said there was a natural increase in the revenue of £150 per annum, and if this was to be maintained the mains must be extended. It was, however, decided to submit the matter to the Sanitary Committee for further consideration.

Cirencester Gas Company, Limited.—In their annual report, the Directors of the Cirencester Gas Company, Limited, state that the revenue account shows a profit for the year to June 30 of £3389. Interest on the debentures and the usual interim dividend have been paid; and the Directors now recommend further dividends at the rate of 12, 6, and £8 8s. per cent. on the several classes of shares—respectively, making 11, 5½, and £7 14s. per cent. for the year. They also recommend that a further sum of £300 be carried to depreciation account. The increase in the consumption of gas has been maintained, and throughout the period of the coal strike the output was normal. There is a considerable increase in the cost of coal for the ensuing year; the price having risen about 2s. 6d. per ton. This will prevent a reduction, which the Directors had hoped to have announced this year, in the price of gas. Last year, owing to illness, Mr. John Beecham retired from the Secretaryship to the Company, which post he had held for thirty years, and his brother, Mr. E. M. Beecham, was appointed his successor.

Value of Road Tarring on Flooded Roads.—The following paragraph, under the heading of "Local Topics," in the "Eastern Daily Press" recently, shows how much the use of tar for roads is appreciated when these have suffered through heavy rains: "Among the many minor lessons to be learned from the floods is one which all highway authorities will, no doubt, make a note of. Wherever roads have been either tar-surfaced or made of tar macadam, they have suffered hardly any damage at all from flooding or from the torrential scour of the great rain. The roads which have been ripped up and torn to pieces by the scour have been the ordinary water-bound roads unsurfaced by tar dressing. The test of the recent devastating weather confirms the test of the past winter or two since tar dressing came into vogue. In capacity for weathering the ordinary rotting effect of wet wintry weather, the tarred roads have come out splendidly. It is abundantly clear that in mitigating the dust nuisance in this way we are also giving a much more efficient quality of resistance to wear and tear to our roads. If a very considerably greater mileage of our country roads had been tar dressed, the cost of so dressing them would have been saved by their immunity from damage during the storm—damage which it will cost a good deal to set right in the case of the scoured-out roads."

Originators of the Exterior Guided Spiral Gasholder.
Insist upon your Spiral Gasholders being fitted with the
"BEARSCOT" SPECIALITIES.
R. & J. DEMPSTER, LTD.
MANCHESTER.
WHICH COMPRISE
All Steel Multiple Expansion Carriages,
Extended Sheets, Safety Stops,
Spiral Plates, Patent Holding Down Bolts, etc.

Water Supply in South Australia.—The great progress made by South Australia during recent years, with the resultant increasing population, has necessitated the carrying out of some important and costly public works. Among these is a scheme to supplement the water supply of Adelaide, and at the same time to serve the fertile districts at the foot of the Mount Lofty Ranges. A Bill authorizing the scheme was recently introduced in the House of Assembly by the Commissioner of Public Works (Hon. R. Butler, M.P.). It is proposed that a reservoir shall be constructed at Millbrook, on the Torrens River, some 17 miles north-east of the city. The work, which will cost £335,400, will result in the impounding of about 2550 million gallons of water, or nearly as much as the Happy Valley reservoir (Adelaide's main source of supply) contains. The execution of the scheme will ensure an ample supply for Adelaide for many years.

Gas Lighting for Shaldon.—The question of providing a system of public lighting for Shaldon has been for some time under the consideration of the Teignmouth District Council, and at a recent meeting the Highway Committee instructed the Surveyor and the Gas Manager (Mr. J. A. Gray) to report on the cost of supplying electricity and gas respectively. Shaldon is within the urban district of Teignmouth, but is separated from the town by the broad estuary of the River Teign. The Highway Committee considered reports by the Gas Manager and the Surveyor at their last meeting, and then decided to recommend the Council to supply gas to Shaldon. It was also resolved that the Teignmouth and Shaldon Bridge Company be approached as to the terms upon which they are prepared to grant a wayleave for a gas-main, and that Mr. Gray be asked to report upon a site for a gas-holder. The question of the necessity of obtaining a Provisional Order was under consideration; and it was decided that the Local Government Board be written to, and that in the meantime the necessary steps be taken to obtain an Order. The Council have confirmed the action of the Committee.

Water Supply of Howden.—A water supply scheme prepared by Mr. Percy Griffith has been adopted by the Howden Rural District Council; and Mr. Griffith has been appointed Engineer. It was explained by Colonel Saltmarshe that the Council had been granted eave to bore for water under very favourable conditions on a site at Dale Plantation, South Newbald—a particularly good site geologically, and lying in a hollow. The estimated cost of the scheme was £56,671, giving an annual charge of £3832, based upon the usual repayment period of thirty years. The scheme also contemplated bringing, in the future, an additional supply from the Selby Water-Works. He did not anticipate that this additional water would be required at first; but should it become necessary, the Riccall district, through which the water would have to be conveyed, would in all probability take a supply, which would lessen the total cost to Howden. Mr. Griffith's report showed that the Selby portion of the scheme, when carried out, would involve an outlay of £8150, and an extra annual charge of £972; but against this might be assumed a contribution from the Riccall rural district, and increased revenue from the Howden area.

Owing to acute differences of opinion, the Tullow (Co. Carlow) Town Commissioners have not met for a considerable time, and municipal government in the town has fallen into a state of chaos. As the streets are in darkness at night, some of the inhabitants have resorted to the use of lighted sacks steeped in paraffin oil and set on lamp-posts.

The Works Committee of the Lewisham Borough Council have received an application from the South Metropolitan Gas Company for permission to fix three high-power gas-standards on the kerb line in Loampit Vale. This is to be granted subject to protective conditions, and to the Company agreeing to supply and light one public street-lamp free of charge to the Council for every twelve special standards erected.

On Monday evening last week, Mr. Thomas Dixon, the founder and head of the Dixon Institute of Scientific Salesmanship and Advertising, delivered the first of a series of lectures on "Scientific Salesmanship" at the Y.M.C.A. Headquarters, Tottenham Court Road. He dealt with the subject in its more general aspects, and emphasized the need for specialization and definite training in salesmanship if the individual is to make the most of his powers and opportunities.

Referring to the meeting of the British Commercial Gas Association in Manchester last week, the "Chemical Trade Journal" on Saturday said: "Manchester this week was the scene of the meeting of the British Commercial Gas Association, which has for its object the popularization of the use of gas for domestic and industrial purposes. We wish this Association every success. We are sure that if the schemes are properly brought before the public, a much larger consumption of gas, particularly for heating purposes, will ensue, with a consequent reduction in the amount of smoke emitted from the domestic chimney. We would also, in this connection, assist those who are making a protest against the confiscation of municipal gas profits in aid of the rates. This is a pernicious practice, and the ratepayer, while perhaps gaining a reduction in the rates, loses a great deal more in the long run."

By prosecuting Ellen Rider, residing at No. 8, Driver's Buildings, Mile End Road, E., for stealing 3s. 7d. from a prepayment meter, the Commercial Gas Company, to whom the meter belonged, performed what the Magistrate (Mr. Chester Jones) who had the charge before him characterized as "a public service." The woman's excuse was that she broke open the meter and took the money because her children were hungry. A detective officer found this to be the case, and he supplied them with food; but their condition, it was alleged, was due to the prisoner, who was receiving an allowance from her husband, from whom she was separated. When an officer from the National Society for the Prevention of Cruelty to Children inspected the home, he found it filthy, and the six children in an awful state. His Worship convicted the accused, but remanded her for a week, in order that some arrangements might be made concerning the children. In passing sentence, he remarked that but for the Company's action the condition of the children would probably not have been brought to the notice of the above-named Society.

Gas Plant and all constructional Steel and Iron Work.

Specialists in Slot Meters, Ordinary Meters, Wet & Dry.

WILLEY & CO., LTD., ENGINEERS,

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Messrs. Ashmore, Benson, Pease, and Co., Limited, of Stockton-on-Tees, have been awarded a contract for supplying and erecting four luteless purifiers 40 ft. by 35 ft., and 10 ft. deep, with substructure and 24-inch Pickering patent connectionless valve, for the "B" station of the Consumers' Gas Company of Toronto. The purifiers will deal with 4 million cubic feet of gas per day.

The Foster Engineering Company, Limited, of Wimbledon, have issued a new pamphlet dealing with their patent gas-governor, and how it improves gas lighting and heating. There is included a chart which was taken by an independent gas engineer at a drapery establishment using gas for both these purposes; and this shows the even pressure obtained on the service by using a Foster governor.

The Team Bye-Product Coke Company, Limited, was registered on Thursday last week with a capital of £170,000, in £1 shares, to carry on the business of "manufacturers of, and dealers in, coke and all products and substances allied to, or found in the manufacture or preparation of, coke by any process; preparers for the market of, and dealers in, the bye-products, gases, and waste heat of and from any coke-ovens, furnaces, or manufactories; colliery proprietors, coal merchants, chemical, fuel, illuminant, and lubricant manufacturers, &c., and to adopt an agreement with H. G. Fenwick and A. Leith.

The brightness of numberless hoardings is now being added to by the appearance thereon of one of Messrs. Curtis's and Harvey's (of Cannon Street House, E.C.) new posters. The name of the "Ironclad" mantle is well adapted for pictorial purposes, and on the present occasion (as has been noticed in connection with previous posters) the artist has utilized his material to excellent effect. There is a sailor of H.M.S. "Reliable," standing between two British "Maids." One of these advertises the "Ironclad" patent metal-top mantle, and the other the "Iris" inverted type—the shapes of the mantles being cleverly made to represent portions of the ladies' fashionable clothing.

Referring to the paragraph in the "JOURNAL" last week (p. 133) on the Thorne and District Water Company, we learn that the mains to be laid for the Company, ranging from 3 to 7 inches diameter, and 13 miles in length, will consist of Mannesmann weldless steel spigot and faucet tubes.

APPLICATIONS FOR LETTERS PATENT.

22,238.—DAVELUY, A., "Acetylene generators." Sept. 30.
22,305.—M'COURT, C. D., and RADIANT-HEATING, LTD., "Heating fluids." Oct. 1.
22,307.—ROUKENS, J., "Gas-stove recuperator." Oct. 1.
22,312.—WILDE, P. R., "Gas-tap regulator." Oct. 1.
22,335.—WILSON, J., and PARKINSON and W. & B. COWAN, LTD., "Control of elastic fluids." Oct. 1.
22,370.—HODGSON, J. L., "Rate of flow meters." Oct. 1.
22,371.—HODGSON, J. L., "Air and gas meters." Oct. 1.
22,382.—GIBBONS, W. P. & G. B. A., MASTERS, R., and DANN, T. V., "Muffles and furnaces." Oct. 2.
22,406.—DAHLHAUS, A., "Purifying liquids by centrifugal action." Oct. 2.
22,510.—M'COURT, C. D., and RADIANT-HEATING, LTD., "Production of light." Oct. 3.
22,512.—FERGUSON, F. H., "Incandescent burners." Oct. 3.
22,620.—BERRY, J., and BRADDOCK, G. H., "Gas-meters." Oct. 4.
22,654.—REGONDI, G., "Gas-burners." Oct. 4.
22,703.—LAMKIN, A. E., and MEAD, F., "Gas water-heater." Oct. 5.
22,722.—MARKS, E. C. R., "Gas-producer systems." A communication from the Standard Gas Power Company. Oct. 5.
22,753.—CLAUDIUS ASH, SONS, AND CO., LTD., and MASON, W., "Valves for gas and water." Oct. 5.

GAS COMPANIES' STOCK AND SHARE LIST.

It is long since the Stock Exchange has had such a week of almost unmitigated unpleasantness as that just concluded. There is no need to recall the cause or causes—they are sharply set in every thinking mind. Things would not have been so bad with us, if we had not been victimized by over-speculative foreign bourses, which, now in a state more or less of panic, overwhelmed us with huge parcels of stocks which pretty well paralyzed the markets they were thrown upon. This state of affairs intensified from day to day, and was at its worst when Saturday closed in general gloom. At the opening on Monday, a praiseworthy attempt was made to be cheerful and to find a bright side to things; but soon a change supervened, and selling orders were the rule. Government issues were the least affected, and Consols sat tight. On Tuesday, the report that war had actually broken out did not tend to improve matters. Consols still held firm; but Rails had a rather smart fall, American were appreciably lower, and Foreign flat. On Wednesday, there was much depression; and the action of foreign bourses was distressing. Gilt-edged became flat, and Consols gave way. Rails fell further, though the last prices were not the worst; and Americans were hit by Wall Street being a free seller. Thursday opened dismally. Selling orders were thick; and upon highly-sensitive markets it does not take much of this to work a serious fall. Later in the day some rather relieving reports checked the rout, and some buyers stepped in. But on Friday, matters were worse than before; and the brief ray of brightness had quite died away. Foreign bourses were rampant to sell; and there was something like a panic in Berlin. Down went everything. Consols touched 73⅛; while other leading markets were still harder hit. It was pay-day; but, happily, there was no mention of a failure. Saturday was a most gloomy day. The volume of Continental selling was at its highest pressure; and markets here were in a most anxious state. Prices were put down freely. Consols were done at 72$\frac{15}{16}$, closing at 72⅞ to 73⅛—a fall of 1 in the week. In the Money Market, there was a good supply for all demands for short loans, but discount stiffened steadily. Business in the Gas Market was on a rather larger scale, though still restricted to a comparatively small number of undertakings. The general tone was firm; the prevailing rush to sell leaving gas companies untouched, with the exception of the premier Company, whose magnitude exposes it in some measure to these passing storms. Gaslight and Coke ordinary was fairly active, and the earlier dealings were as good as 105½, but 103¾ was touched on Saturday. In the secured issues, the maximum marked 82 and 83, the preference from 100 to 101⅛ (a rise of ½), and the debenture 76¾ and 78. South Metropolitan was quiet and firm at 116¼ to 117½; and the debenture made 78. In Commercials, the 4 per cent. realized 107½; and the 3½ per cent. 102½. Among the Suburban and Provincial group, Bournemouth "B" changed hands at 16 and 16⅛, Brentford preference at 117, Brighton and Hove original at 215, and South Suburban at 119 and 120. On the local Exchanges, Sheffield "B" and "C" fetched 230 each, Liverpool "A" 216, and ditto "B" 156 and 156½. In the Continental companies, Imperial marked from 183 to 185 (a rise of 1), ditto debenture from 86⅜ to 87⅛, and European from 19¾ to 19⅞. Among the undertakings of the remoter world, Bombay realized from 6$\frac{11}{16}$ to 6⅝, Primitiva from 6$\frac{1}{16}$ to 6⅞, ditto preference from 5 to 5¼, ditto debenture 96⅜, and River Plate debenture 94¼ and 94½.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
1,551,868	Stk.	Oct. 11	5	Alliance & Dublin Ord.	76—81*	+½	6 3 5
374,000	Stk.	July 12	4	Do. 4 p.c. Deb.	89—91	..	4 7 11
250,000	5	Oct. 11	7½	Bombay, Ltd.	6⅞—6$\frac{15}{16}$*	..	5 9 1
60,000	10	Aug. 29	15	Bourne- 10 p.c.	28—29	..	5 3 5
332,000	10	"	7	mouth Gas B 7 p.c.	15⅝—16⅝	..	4 6 2
75,000	10	"	6	and Water Pref. 6 p.c.	14—14⅝	..	4 2 9
380,000	Stk.	Aug. 14	13½	Brentford Consolidated	255—260	..	5 3 10
330,000	"	"	10½	Do. New	195—200	..	5 5 0
50,000	"	"	5	Do. 5 p.c. Pref.	116—118	..	4 4 9
206,250	"	June 14	4	Do. 4 p.c. Deb.	96—98	..	4 1 8
218,230	Stk.	Aug. 29	11	Brighton & Hove Orig.	210—215	..	5 2 4
244,200	"	"	8	Do. A Ord. Stk.	152—155	..	5 3 3
530,000	20	Sept. 27	12½	British	44—45	..	5 11 1
120,000	Stk.	June 28	4	Do. 4 p.c. Deb. Stk.	91—93	..	4 6 0
250,000	Stk.	June 28	4	Buenos Ayres 4 p.c. Deb.	93—95	..	4 4 3
100,000	10	—	—	Cape Town & Dis., Ltd.	2—3	..	—
100,000	10	—	—	Do. 4½ p.c. Pref.	3¾—4½	..	—
100,000	Stk.	June 28	4½	Do. 4½ p.c. Deb. Stk.	70—73	..	6 3 3
157,150	Stk.	Aug. 29	5	Chester 5 p.c. Ord.	107½—109½	..	4 11 4
1,513,280	Stk.	Aug. 29	5/9/4	Commercial 4 p.c. Stk.	106—108	..	5 1 2
560,000	"	"	5½	Do. 3½ p.c. do.	101—103	..	5 3 6
475,000	"	June 14	3	Do. 3 p.c. Deb. Stk.	73—75	..	4 0 0
800,000	Stk.	May 31	4	Continental Union, Ltd.	83—86	..	4 13 0
200,000	"	"	7	Do. 7 p.c. Pref.	133—135	..	5 3 8
492,270	Stk.	—	5⅔	Derby Con. Stk.	124—125	..	4 12 0
55,000	"	—	4	Do. Deb. Stk.	103—105	..	3 16 2
1,002,180	10	July 26	10	European, Ltd.	19—20	..	5 0 0
16,160,600	Stk.	Aug. 14	4/17/4	Gas- 4 p.c. Ord.	103—105	−1½	4 12 8
2,600,000	"	"	3½	light 3½ p.c. max.	81—84	..	4 3 4
4,062,235	"	"	4	and 4 p.c. Con. Pref.	99½—101½	+½	3 18 10
4,531,705	"	June 14	3	Coke 3 p.c. Con. Deb.	76—78	..	3 16 11
258,740	Stk.	Sept. 13	5	Hastings & St. L. 3½ p.c.	91—93	..	5 7 6
82,500	"	"	6½	Do. do. 5 p.c.	—	..	—
70,000	10	Oct. 11	11	Hongkong & China, Ltd.	16—16½	..	6 13 4
131,000	Stk.	Sept. 13	7⅞	Ilford A and C	154—157	..	4 17 1
65,780	"	"	6⅞	Do. B	121—123	..	4 19 7
65,500	"	June 28	4	Do. 4 p.c. Deb.	91—93	..	4 6 0
4,940,060	Stk.	May 15	9	Imperial Continental	182—185	+1	4 17 3
1,235,000	Stk.	Aug. 14	3½	Do. 3½ p.c. Deb. Red.	86—88	..	3 19 7
200,242	Stk.	Aug. 29	6	Lea Bridge Ord. 5 p.c.	122—125	..	4 16 0
561,000	Stk.	Aug. 29	10	Liverpool United A.	215—217	..	4 12 2
718,100	"	"	7	Do. B.	155—157	..	4 9 2
906,083	"	June 28	4	Do. Deb. Stk.	100—102	..	3 18 5
63,480	Stk.	June 28	3	Maidstone 3 p.c. Deb.	69—71	+3	4 4 6
75,000	5	June 14	6	Malta & Mediterranean	4⅜—4⅞	..	6 8 1
250,000	100	Oct. 1	4½	Met. of Melbourne 4½ p.c. Deb.	99—101	..	4 9 1
541,920	20	May 31	3½	Monte Video, Ltd.	11—11½	..	6 1 9
1,775,892	Stk.	July 26	4⅜	Newc'tle&G'tesh'd Con.	98½—99	..	4 8 5
529,705	Stk.	June 28	3½	Do. 3½ p.c. Deb.	84½—85½	..	4 2 1
55,940	10	Aug. 29	7/7/0	North Middlesex 7 p.c.	13¾—14½	..	5 1 4
300,000	Stk.	May 15	8	Oriental, Ltd.	134—136	..	5 17 8
60,000	5	Sept. 27	10	Ottoman, Ltd.	8¼—8⅝	..	5 14 3
60,000	50	Aug. 14	13	Portsea Island B	127—130	..	5 0 0
100,000	50	"	12	Do. C	124—127	..	4 14 6
398,490	5	Oct. 11	8	Primitiva Ord.	6⅝—6⅞*	..	5 16 5
796,980	5	June 28	5	Do. 5 p.c. Pref.	5—5¼	−⅛	4 15 3
488,900	100	June 1	4	Do. 4 p.c. Deb.	96—98	..	4 1 8
312,650	Stk.	June 28	4	River Plate 4 p.c. Deb.	93—95	..	4 4 3
275,000	5	Apl. 12	12	San Paulo, Ltd.	13—14	..	4 5 9
150,000	10	Sept. 27	6	Do. 6 p.c. Pref.	11½—12	..	5 0 0
125,000	50	July 1	5	Do. 5 p.c. Deb.	49—51	..	4 18 0
135,000	Stk.	Aug. 29	10	Sheffield A	229—231	..	4 6 7
209,984	"	"	10	Do. B	229—231	..	4 6 7
523,500	"	"	10	Do. C	229—231	..	4 6 7
90,000	10	Sept. 27	7½	South African	9—10	..	7 10 0
6,429,895	Stk.	Aug. 29	5/9/4	South Met., 4 p.c. Ord.	116—118	..	4 12 8
1,895,445	"	July 12	8	Do. 3 p.c. Deb.	76—79	..	3 15 11
209,820	Stk.	Aug. 14	8½	South Shields Con. Stk.	162—164	..	5 3 8
605,000	Stk.	Aug. 14	5/16/8	S'th Suburb'n Ord. 5 p.c.	119—121	..	4 16 3
60,000	"	"	5	Do. 5 p.c. Pref.	116—118	..	4 4 9
117,058	"	July 12	5	Do. 5 p.c. Deb. Stk.	120—122	..	4 2 0
502,310	Stk.	May 15	5	Southampton Ord.	105—107	..	4 13 6
120,000	Stk.	Aug. 14	7½	Tottenham A 5 p.c.	142—145	..	5 0 0
483,940	"	"	5⅔	and B 3½ p.c.	114—116	..	4 19 2
149,470	"	June 28	4	Edmonton 4 p.c. Deb.	94—96	..	4 3 4
182,380	10	June 15	5	Tuscan, Ltd.	8½—8⅝	..	5 15 11
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	97—99	..	5 1 0
236,476	Stk.	Aug. 14	5	Tynemouth, 5 p.c. max.	114—115	..	4 6 11
255,636	Stk.	Aug. 29	6⅞	Wands- B 3½ p.c.	138—141	..	4 17 6
85,766	"	June 28	3	worth 3 p.c. Deb. Stk.	70—72	..	4 3 4

Prices Marked * are "Ex. Div."